648-Port EDR InfiniBand Switch-IB™ Switch Platform Hardware User Manual

PN: MCS7500

Rev 1.0

www.mellanox.com

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Revision History

Table 1 - User Manual Revision History

Rev	Date	Description
1.0	19 August 2015	First release

About this Manual

This manual provides an overview of the Switch-IB™ based InfiniBand CS7500 director switch and guidelines for its operation.

Intended Audience

This manual is intended for users and system administrators responsible for installing and setting up the chassis platform.

The manual assumes familiarity with the InfiniBand® architecture specification.

Related Documentation

The documentation set accompanying the QSFP28 Chassis InfiniBand Switch platform includes the following:

Table 2 - Reference Documents and Websites

Document Name	Description
InfiniBand Architecture Specification, Vol. 1, Release 1.2.1	The InfiniBand Architecture Specification that is provided by IBTA
Switch Product Release Notes	For possible hardware issues see the switch support product page. This requires a customer support login. Look up the relevant Switch-IB™ based switch system/series release note file.
MLNX-OS® User Manual for VPI	This document contains information regarding configuring and managing Mellanox Technologies SwitchX® switch platforms listing all of the commands available through MLNX-OS with explanations and examples.
Dismantling Procedures	Dismantling user guides for Mellanox Technologies products organized by product category. http://www.mellanox.com/page/dismantling_procedures

Conventions

Throughout this manual, the name CS7500 and the terms chassis and switch are used to describe the port QSFP28 InfiniBand chassis, unless explicitly indicated otherwise.

The following icons are used throughout this document to indicate information that is important to the user.



This symbol indicates information that is helpful to the user.



This symbol indicates a situation that can potentially cause damage to hardware or software.

This symbol makes recommendations to the user.

Mellanox Part Numbering Legend

Table 3 - Chassis Installation Kit Items

Place	Field	Decoder
M	Company name	Mellanox Technologies
CS/MB/SB	Switch system type	Chassis/Management Board/ Switch-IB™ in leaf or spine module
A	Data rate	7 – EDR InfiniBand
B	System type	5 – director switch
XX	Number of ports	00 – 648 ports 10 – 324 ports 20 – 216 ports

1 Overview

This chapter provides an overview of the CS7500 QSFP28 InfiniBand director switch platform (referenced in this document as "the chassis" or "the switch") and its operational environment.

Mellanox CS7500 switch system provides the highest performing fabric solution by delivering high bandwidth and low latency to enterprise data centers (EDC), high-performance computing (HPC) and embedded environments. Networks built with the CS7500 system can carry converged traffic with the combination of assured bandwidth and granular quality of service. Built with Mellanox's 6th generation of Switch-IB™ switch devices, CS7500 systems provide up to 100Gb/s full bidirectional bandwidth per port. With up to 648 ports in a 28U rack space, this system is among the densest switching systems available.

The switch platform comes pre-installed with all necessary firmware for standard operation within an InfiniBand fabric and requires an InfiniBand compliant Subnet Manager running from one of the hosts or the management module of the switch system. The initial configuration procedure should be followed to initialize the switch before connecting it to the network after which normal operation can proceed. (See the installation guide for details regarding the initial configuration.) Once connected to the network, the Subnet Management software automatically discovers and configures the fabric and begins utilizing the switch.

The Mellanox Operating System (MLNX-OS®) software package provides a subnet manager and network management tools as well as connectivity software for servers and storage, and is available on the Mellanox website.

Basic installation is covered in Chapter 2, "Installation" on page 17.

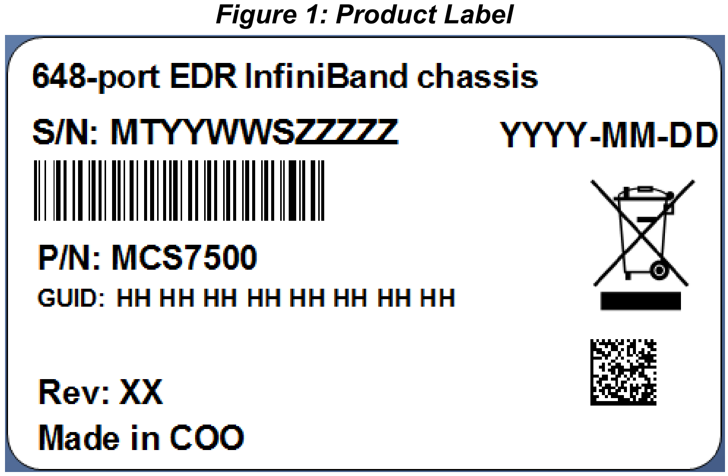
Hot-swapping components and hardware maintenance is covered in Section 2.9, "Hot Swap Insertion and Extraction," on page 46.

1.1 Product Information

1.1.1 Serial Number and Product Version Information

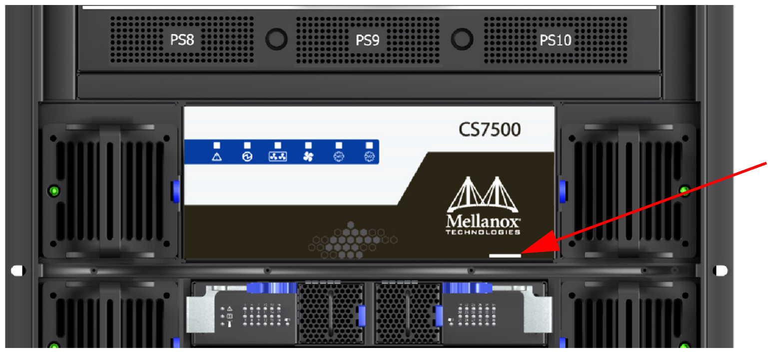
The serial number, GUID identifier and product version information are found on the label attached to the pull-out tab below the Mellanox logo on the spine side of the chassis.

Figure 1: Product Label



The GUID is the System Image GUID according to the IB spec. It is burned on the board which is in the chassis. All the boards and the management software look for this GUID in addition to their own Node GUID.

Figure 2: Product Label Tab Location

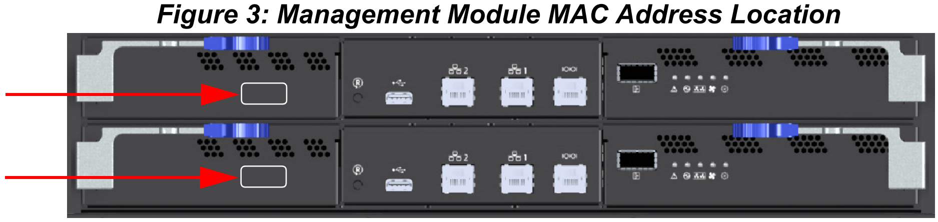


The product label tab is located here on the spine side

1.1.2 Management Module MAC

Each management module has a label with its MAC address. See Figure 3 for the location of this label.

Figure 3: Management Module MAC Address Location



1.1.3 Product Physical Specifications and Power

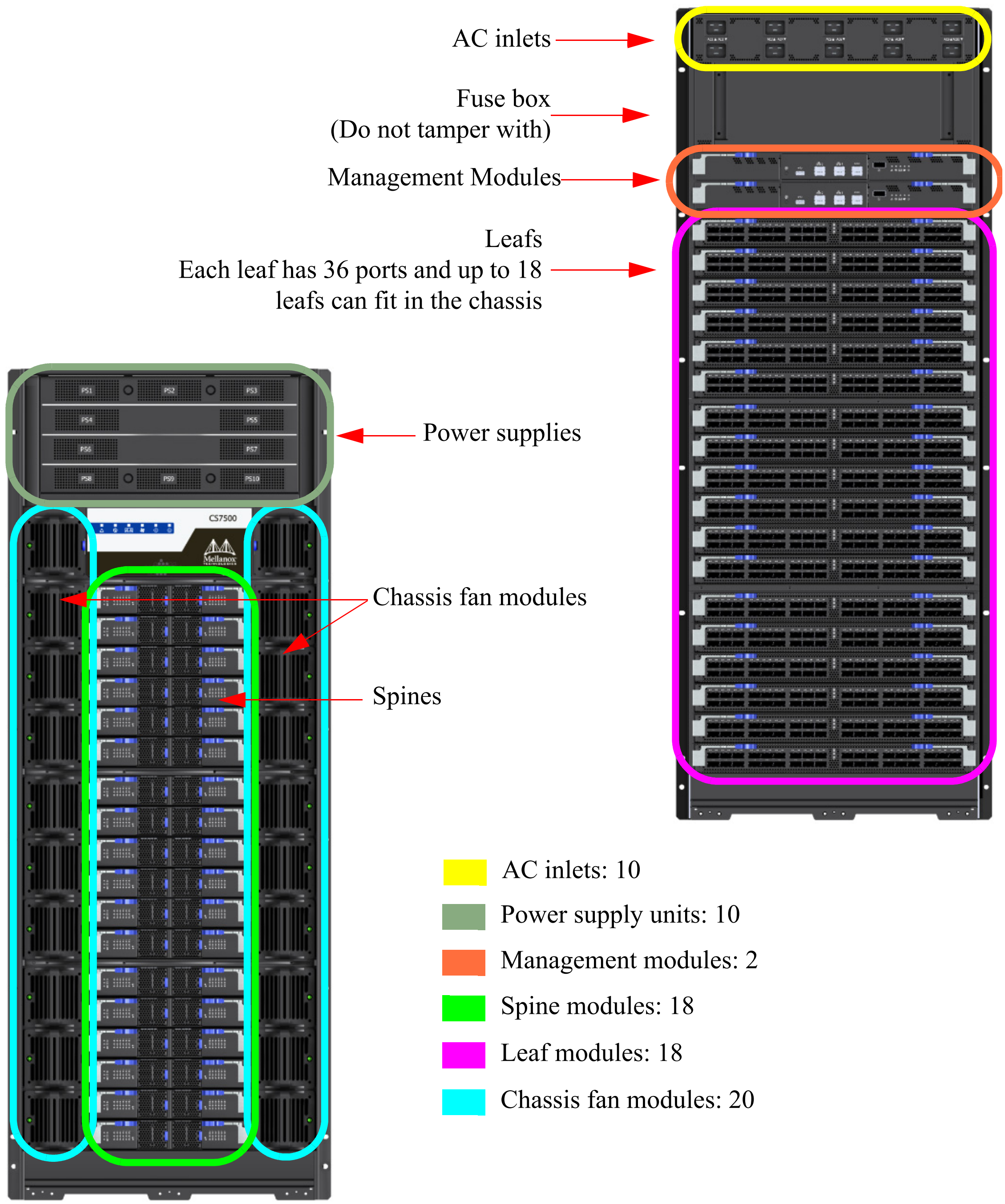
The switch itself is 28U tall but requires an extra 1U to install the shelf.

The switch ships in a minimum base configuration plus additional modules depending on the chosen customer configuration. Optional modules included:

- Management modules
- Spine modules
- Leaf modules

The following figure shows the leaf and spine sides fully populated.

Figure 4: CS7500



1.2 Features List

- 648 EDR (100Gb/s) InfiniBand ports in a 28U switch
- 130 Tb/s aggregate data switching capacity with ultra low latency
- IBTA 1.3 and 1.2.1 compliant
- Up to EDR link speeds
- N+N power supply
- Chassis high availability
- sMB high availability

1.3 InfiniBand EDR Overview

The Mellanox CS7500 switch system supports EDR, standard InfiniBand data rate, where each lane of a 4X port runs a bit rate of 25.78125Gb/s. The EDR physical layer is an IBTA specified physical layer using different block types, deskew mechanism and framing rules.

Both FDR and EDR support Forward Error Correction (FEC), as described in IEEE Std 802.3ap-2007 (Amendment to IEEE Std 802.3-2005) chapter 74.

> EDR is only guaranteed to work with approved Mellanox cables.

1.4 Power Supply Redundancy

The MCS7500 platform comes standard with 10 power supplies. Each power supply is capable to provide $48V_{DC}$ 2500W output power.

1.4.1 AC Source Requirements

MCS7500 system supports $220V_{AC}$ operation only. No support for $110V_{AC}$ source. Each AC source should be capable of providing at least 12A input current.

1.4.2 Power Redundancy

The minimum complement of PSUs which allows the chassis to run at full capacity is 5. The following two redundancy options are available:

- No redundancy (combined mode)
- N+N configuration (grid-redundant mode)

> N+N redundancy only works with a supply voltage of 220V.

The chassis PSUs are fed from two power grids for high availability. The second power grid can be supplied by any of the following:

- a backup power supply grid
- a generator

- a battery backup system
- any combination of the above

Connecting 5 power supplies to one power supply grid and the remaining 5 power supplies to a secondary power supply grid will create N+N redundancy. This is high availability. Under these conditions should a power grid fail (an electric company power failure or blackout for example) power grid High Availability will continue to keep the chassis running at full capacity through the secondary or backup power supply grid.

> The system cannot run with less than 5 PSUs, thus if one of the power grids is down there is no power or PSU redundancy in the system.

When the power drops below the required minimum due to power supply failure, MLNX-OS® may power down some leafs. If this happens it may be necessary to reboot the chassis once the defective PSU has been replaced. Two ways to reboot are to use the reboot command in the CLI or reboot through the WebUI.

Table 4 - Power Supply OPN

PSU OPN	Wattage	Description
MTDF-PS-A	2500W	Supplies N+N redundancy for all switch chassis at 220 Volts

2 Installation

This chassis can be installed in standard 19" racks that have depths between 715-850mm between the vertical supports of the rack.

Installation and initialization of the chassis is a simple process requiring attention to the normal mechanical, power, and thermal precautions for rack-mounted equipment. The chassis comes only with the power supplies and fans pre-installed. The rest of the openings are populated with blanks. All of the leafs, spines, and management modules are shipped in a separate package.

The chassis requires initial configuration to get the chassis and fabric management up and running through remote management.

This unit is intended for installation in a restricted access location. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.

2.1 Installation Safety Warnings

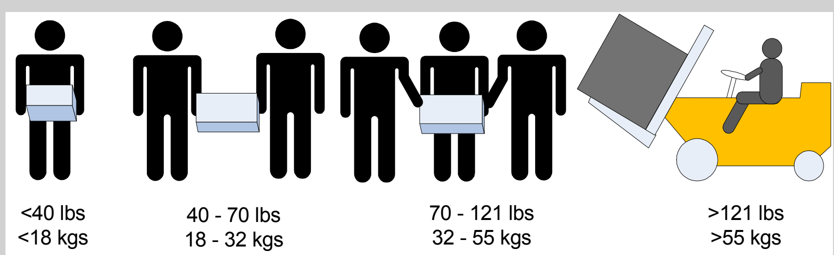
These safety warnings are in English. For Hebrew, Chinese, French, German, Spanish, Russian, Romanian, Croatian, Italian, or Turkish see the appendixes.

1. Installation Instructions

Read all installation instructions before connecting the equipment to the power source.

2. Bodily Injury Due to Weight

Use enough people to safely lift this product.



3. Heavy Equipment

This equipment is very heavy and should be moved using a mechanical lift to avoid injuries.

4. Installation in Restricted Access Location

This unit is intended for installation in a Restricted Access Location.

5. Risk of Electric Shock

Risk of Electric Shock!
With the fan module removed power pins are accessible within the module cavity.
DO NOT insert tools or body parts into the fan module cavity.

6. Over-temperature

This equipment should not be operated in an area with an ambient temperature exceeding the maximum recommended: 40°C (104°F). Moreover, to guarantee proper air flow, allow at least 8cm (3 inches) of clearance around the ventilation openings.

7. Stacking the Chassis

The chassis should not be stacked on any other equipment. If the chassis falls, it can cause bodily injury and equipment damage.

8. Redundant Power Supply Connection – Electrical Hazard

This product includes a redundant power or a blank in its place. In case of a blank power supply, do not operate the product with the blank cover removed or not securely fastened.

9. Double Pole/Neutral Fusing

This system has double pole/neutral fusing. Remove all power cords before opening the cover of this product or touching any internal parts.

10. Multiple Power Inlets

Risk of electric shock and energy hazard.
The PSUs are all independent.
Disconnect all power supplies to ensure a powered down state inside of the switch platform.

11. During Lightning – Electrical Hazard

During periods of lightning activity, do not work on the equipment or connect or disconnect cables.

12. Copper InfiniBand Cable Connecting/Disconnecting

Copper InfiniBand cables are heavy and not flexible, as such they should be carefully attached to or detached from the connectors. Refer to the cable manufacturer for special warnings/instructions.

13. Rack Mounting and Servicing

When this product is mounted or serviced in a rack, special precautions must be taken to ensure that the system remains stable. In general you should fill the rack with equipment starting from the bottom to the top.

14. Equipment Installation

This equipment should be installed, replaced, and/or serviced only by trained and qualified personnel.

15. Equipment Disposal

Disposal of this equipment should be in accordance to all national laws and regulations.

16. Local and National Electrical Codes

This equipment should be installed in compliance with local and national electrical codes.

17. Installation Codes

This device must be installed according to the latest version of the country national electrical codes. For North America, equipment must be installed in accordance to the applicable requirements in the US National Electrical Code and the Canadian Electrical Code.

18. Battery Replacement

Warning: Replace only with UL Recognized battery, certified for maximum abnormal charging current not less than 4mA

There is a risk of explosion should the battery be replaced with a battery of an incorrect type.

Dispose of used batteries according to the instructions.

19. UL Listed and CSA Certified Power Supply Cord

For North American power connection, select a power supply cord that is UL Listed and CSA Certified, 3 - conductor, [16 AWG], terminated with a molded plug rated at 125 V, [13 A], with a minimum length of 1.5m [six feet] but no longer than 4.5m.

For European connection, select a power supply cord that is internationally harmonized and marked “<HAR>”, 3 - conductor, minimum 1.0 mm^2 wire, rated at 300 V, with a PVC insulated jacket. The cord must have a molded plug rated at 250 V, 10 A.

20. High Leakage Current

Warning: High leakage current; Earth connection essential before connecting supply.

21. Add GND connection information

Before connecting this device to the power line, the protective earth terminal screws of this device must be connected to the protective earth in the building installation.

(GND Connection Information):

The building installation shall provide a means for a connection to protective earth; and the equipment shall be permanently connected to that by a service person.

A SERVICE PERSON shall check whether or not the socket - outlet from which the equipment is to be powered provides a connection to the building protective earth. If not, the SERVICE PERSON shall arrange for the installation of a PROTECTIVE EARTHING CONDUCTOR from the separate protective earthing terminal to the protective earth wire in the building. The equipment shall be installed in area where equipotential bonding exists ((such as a telecommunication centre or a dedicated computer room).

22. Installation Codes

This device must be installed according to the latest version of the country national electrical codes. For North America, equipment must be installed in accordance to the applicable requirements in the US National Electrical Code and the Canadian Electrical Code.

23. Interconnection of Units

Cables for connecting to the unit RS232 and Ethernet Interfaces must be UL certified type DP-1 or DP-2. (Note- when residing in non LPS circuit)

Overcurrent Protection: A readily accessible Listed branch circuit overcurrent protective device rated 20 A must be incorporated in the building wiring.

24. Hazardous Radiation Exposure

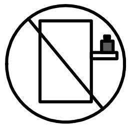
Caution – Use of controls or adjustment or performance of procedures other than those specified herein may result in hazardous radiation exposure.

CLASS 1 LASER PRODUCT and reference to the most recent laser standards IEC 60 825-1:1993 + A1:1997 + A2:2001 and EN 60825-1:1994+A1:1996+ A2:2001

25. Proper Enclosure

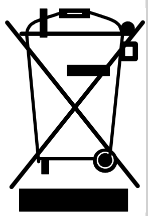
A suitable electrical, mechanical and fire enclosure shall be provided by the end product manufacturer and or the end user.

26. Do Not Use the Switch as a Shelf or Work Space



Caution: Slide/rail mounted equipment is not to be used as a shelf or a work space. The rails are not intended for sliding the unit away from the rack. It is for permanent installation at final resting place only, not used for service and maintenance

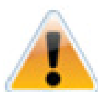
27. WEEE Directive



According to the WEEE Directive 2002/96/EC, all waste electrical and electronic equipment (EEE) should be collected separately and not disposed of with regular household waste.

Dispose of this product and all of its parts in a responsible and environmentally friendly way.

28. Country of Norway Power Restrictions



This unit is intended for connection to a TN power system and an IT power system of Norway only.

2.2 Environmental and Safety Recommendations

The following are Mellanox recommendations.

Recommended ambient temperature in the System room is 20±5°C.
Recommended humidity range is 40%±15% without condensing.

It is highly recommended that the installation sites be as isolated as possible from all sources of radio transmissions and electrical interference.

It is highly recommended that the installation site building be equipped with a lightning rod.

It is highly recommended that the installation site be equipped with smoke detectors and a fire alarm warning system.

The system requires a KVA rated UPS system. It is recommended that a UPS system be installed to protect the equipment in the event of unexpected power failure.

Make sure that the outlets and circuits will not be overloaded. Spread out the load over at least two or three circuits or use a 3 phase circuit.

2.3 Switch Components

The system's components are shipped as specified below.

Chassis Crate

The switch system chassis is shipped in a dedicated crate which includes the following boxes:

1. CS7500 chassis
2. Chassis installation kit (see Table 5, "Chassis Installation Kit Items," on page 26)
3. Cable holders (see Table 6, "Cable Management Installation Kit Parts," on page 28)
4. 6 boxes containing cable shelves and 1 box containing 10 power cords (250V 16A 2m, C19 to C20, USA UL Standard)

The management, spine, and leaf modules are shipped separately.

To completely populate the CS7500 chassis, one requires 2 management module boxes, 18 spine module boxes, and 18 leaf module boxes.

Spine Module Boxes

Each box contains 1 spine module with its fan modules already installed.

This unit is intended for installation in a restricted access location. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.

Leaf Module Boxes

Each box contains 1 leaf module.

Management Module Boxes

Each box contains 1 management module and 1 RJ45-to-DB9 cable.

2.4 Unpacking the Switch System

2.4.1 Verifying Crate Condition

The create has a shock sticker applied. When receiving the create, look for and inspect the shock sticker to confirm that it has not triggered.

IMPORTANT NOTE
The shock sticker does not necessarily indicate damage to the contents. However, be sure to carefully inspect the contents of a crate with a triggered sticker.

The shock stickers turn red if the create has been mishandled or handled roughly. If one of the shock stickers is red, notify the shipper and Mellanox.

Figure 5: Shock Stickers



Unaffected stickers



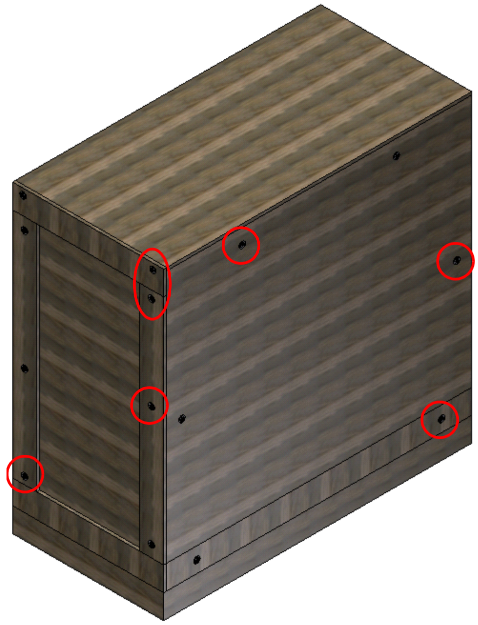
Triggered stickers

2.4.2 Opening the Chassis Crate

1. Before starting the procedure, put the ESD strap on and connect it to a valid ground.
2. Unscrew and remove the top cover of the crate.
3. Unscrew and remove the sides of the crate.

> It is highly recommended to have a screw gun or electric screwdriver for this step.

Figure 6: Crate Screws



4. Remove the nylon covers from the chassis.
5. Visually inspect the chassis, make sure that:
   - There is no visible damage
   - 10 PSUs are installed
6. Remove all protective plastic film from the sides and top of the chassis.

Unpack the system and check against the parts list to make sure that all the parts have been sent. Check the parts for visible damage that may have occurred during shipping. If anything is damaged or missing, contact your customer representative immediately.

Do not remove any of the blocks or the lock-down bars at this time.

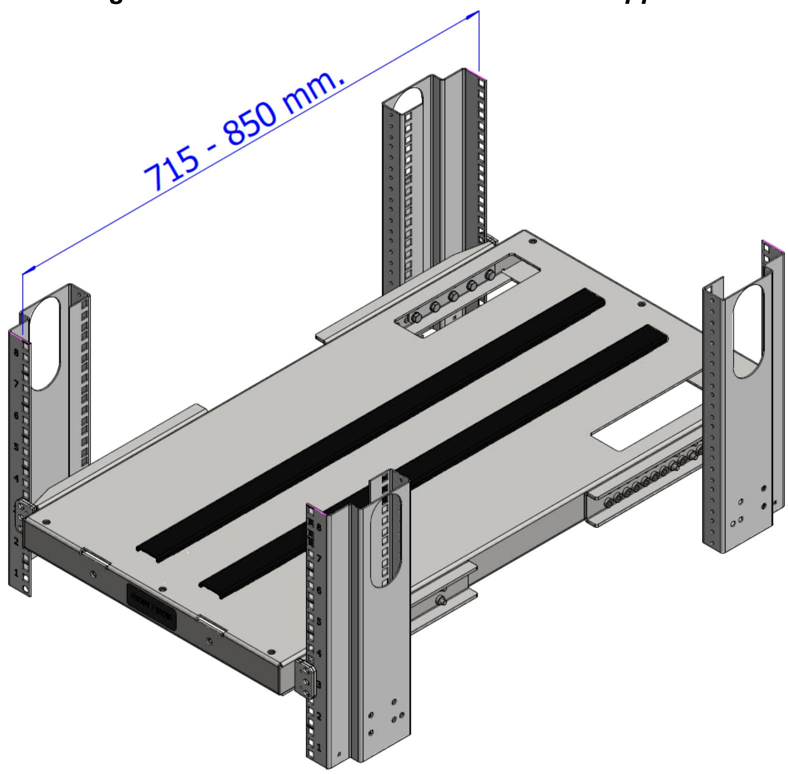
2.5 Physical Installation

The rack mounting holes conform to the EIA-310 standard for 19-inch racks. Guarantee proper ventilation, by leaving 8cm (3") of space to the front and rear of the switch. This ensures proper airflow through the chassis. This is crucial for maintaining good airflow at ambient temperature. In particular, route cables such that they do not impede the air into or out of the chassis.

Warning: This equipment is very heavy (257kg; 567lb). Safety is the first concern. Make sure that adequate manpower and proper equipment is used for transporting and moving the chassis.

This chassis can be installed in standard 19” racks that have 715-850mm between the vertical supports of the rack.

Figure 7: Distance Between the Vertical Supports



The vertical supports may have to be moved so that the vertical support closest to the door is a minimum of 6cm from the inside of the door. This is required so that the shelf does not hit the door.

> If you move the vertical supports make sure that you reinstall them vertically plumb.

The switch platform uses 29U of rack space, 28U for the chassis and 1U for the shelf. The switch ships from the factory with mounting holes on the spine side. There are upper brackets to connect the leaf side to the rack near the top of the chassis, and there are two lock-down bars to secure the chassis to the shelf. The weight of the switch is supported from underneath the unit by the shelf.

> Due to the space required by up to 648 connector cables, it is recommended to use a rack that is 120cm long and 80cm wide. This should allow for proper cable management and enough ventilation to properly cool the chassis.

Before starting any procedure on the CS7500 switch system:

1. Put an ESD prevention wrist strap on your wrist, and make sure there is good contact between your body and the strap.

2. Plug the other end of the wrist strap to a valid ground. Make sure that this is a tight fit.

You may need a fork lift to move and insert the chassis into the rack.

2.5.1 Installation Kit Parts

It is recommended to use an AWG6 or 4mm diameter wire for grounding purposes.

It is recommended to have at least three people for the duration of the installation procedure. Use a mechanical lift to raise this chassis. If not, use enough manpower to ensure the safety and wellbeing of all of the people involved in the installation.

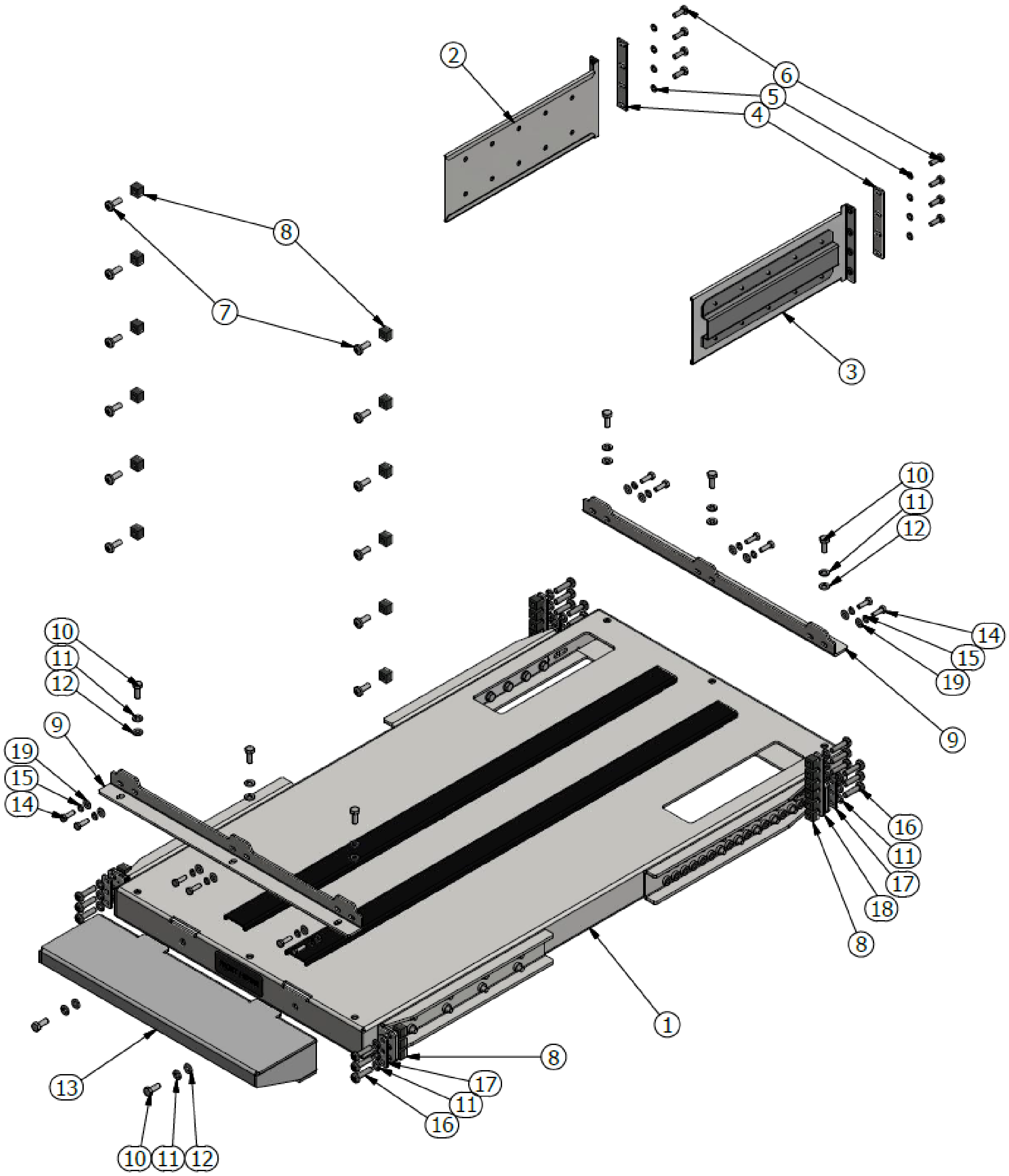
Chassis Installation Kit

Table 5 - Chassis Installation Kit Items

Item No.[a]	Quantity	Description	Item No.	Quantity	Description
1	1	Shelf assembly	11	26	M6 spring washer
2	1	Riveted right chassis slide	12	8	M6 flat washer
3	1	Riveted left chassis slide	13	1	Bracket weld
4	2	4-oval-washer plate	14	12	10-32 hex-head screw
5	8	M5 spring washer	15	12	Washer spring #10
6	8	M5 pan-head screw	16	18	M6X25 pan head screw
7	12	M6X16 pan-head screw	17	4	Shelf rear arm bracket
8	30	M6 cage nut	18	2	Support bracket
9	2	Perforated fixing bracket	19	12	Washer #10
10	8	M6X16 hex-head screw	—	—	————————

a. Use the item number to identify the corresponding item in Figure 8. Each item number appears in a call-out bubble.

Figure 8: Chassis Installation Kit



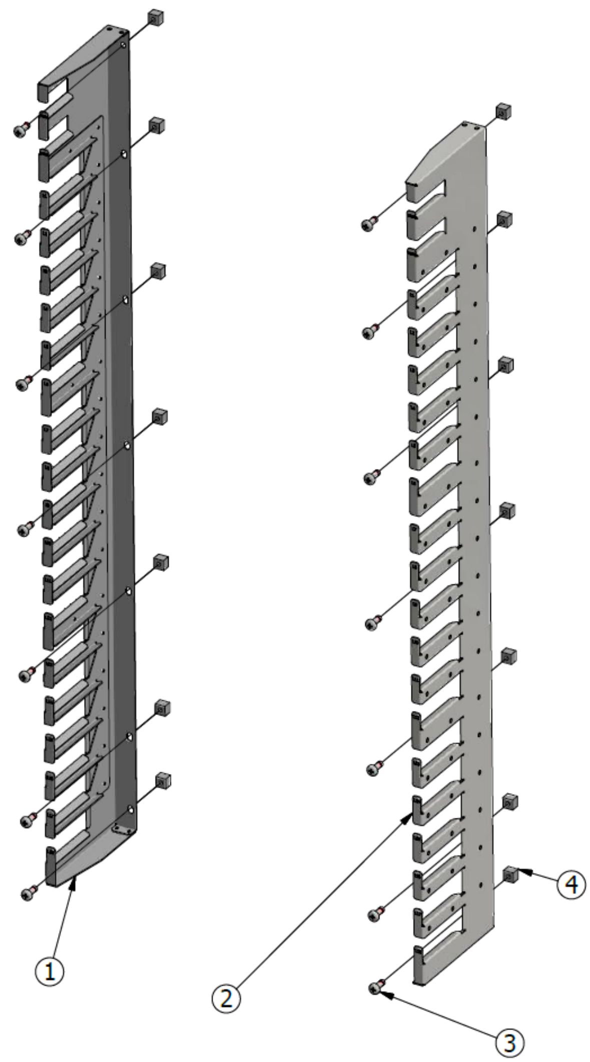
Cable Management Installation Kit

Table 6 - Cable Management Installation Kit Parts

Item No.[a]	Quantity	Description	Item No.	Quantity	Description
1	1	Left riveted cable holder	3	14	Pan head screw
2	1	right riveted cable holder	4	14	M6 cage nut

a. Use the item number to identify the corresponding item in Figure 9. Each item number appears in a call-out bubble.

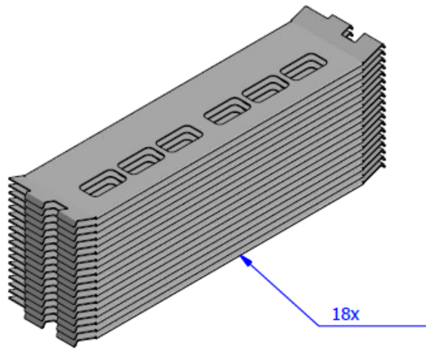
Figure 9: Cable Management Installation



Shelf Installation Kit

The shelf installation kit includes 18 cable supporters only.

Figure 10: Shelf Installation Kit



2.5.2 Installation Procedure

Step 1. Insert all the cage nuts necessary for the following steps of the installation procedure in the rack.

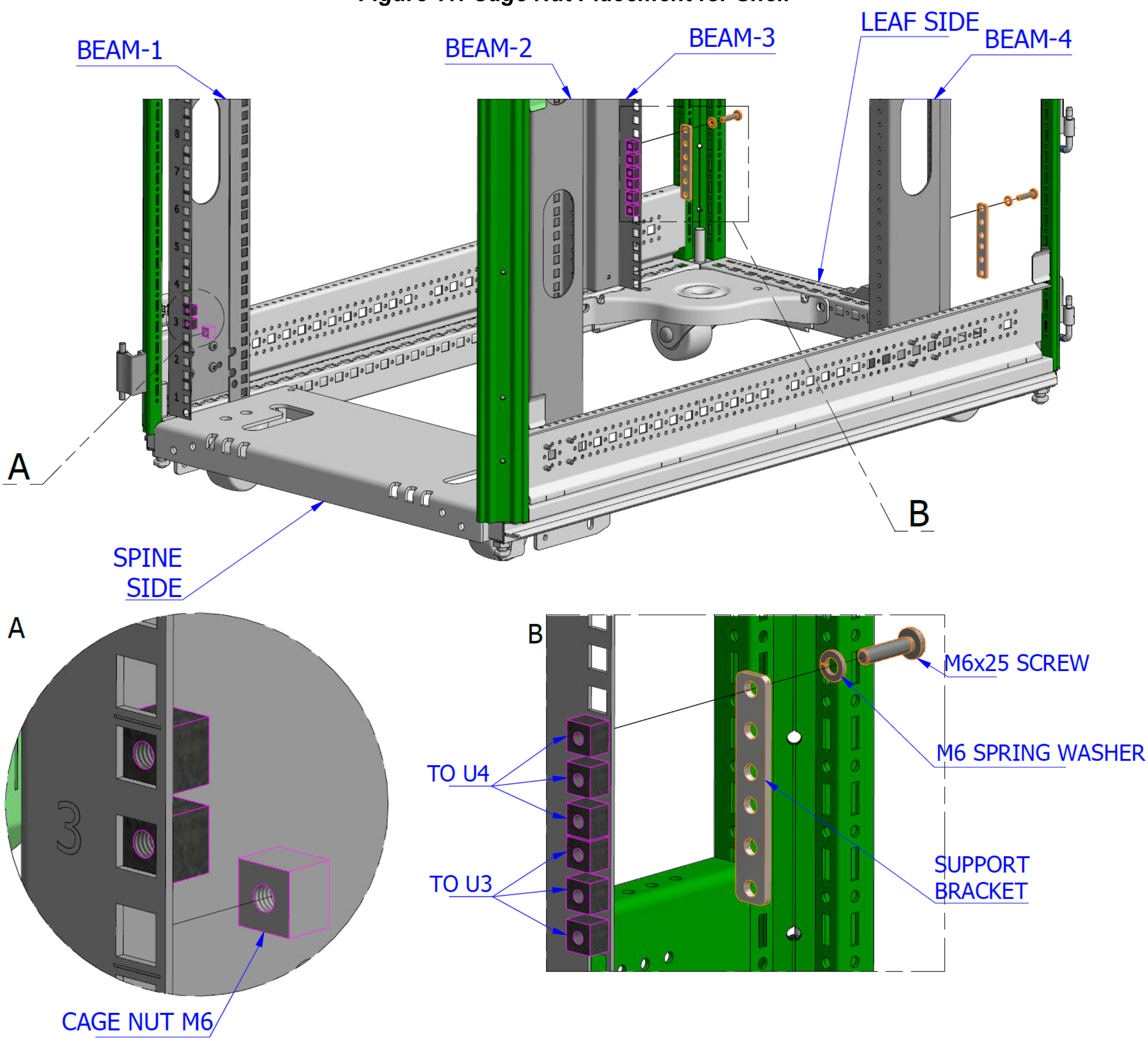
a. Insert 3 M6 cage nuts from the inside of beam 1 and 2 meant to support the shelf (Figure 11).

> It is recommended to set the shelf at U3 since the chassis would roll off easily on it from the pallet.

b. Insert 6 M6 cage nuts from the inside of beam 3 and 4 meant to support the shelf (Figure 11).

c. Place the top end of the support bracket at the top of U4 using the M6x25 screw on beams 3 and 4. **Do not** tighten the screw completely at this point.

Figure 11: Cage Nut Placement for Shelf

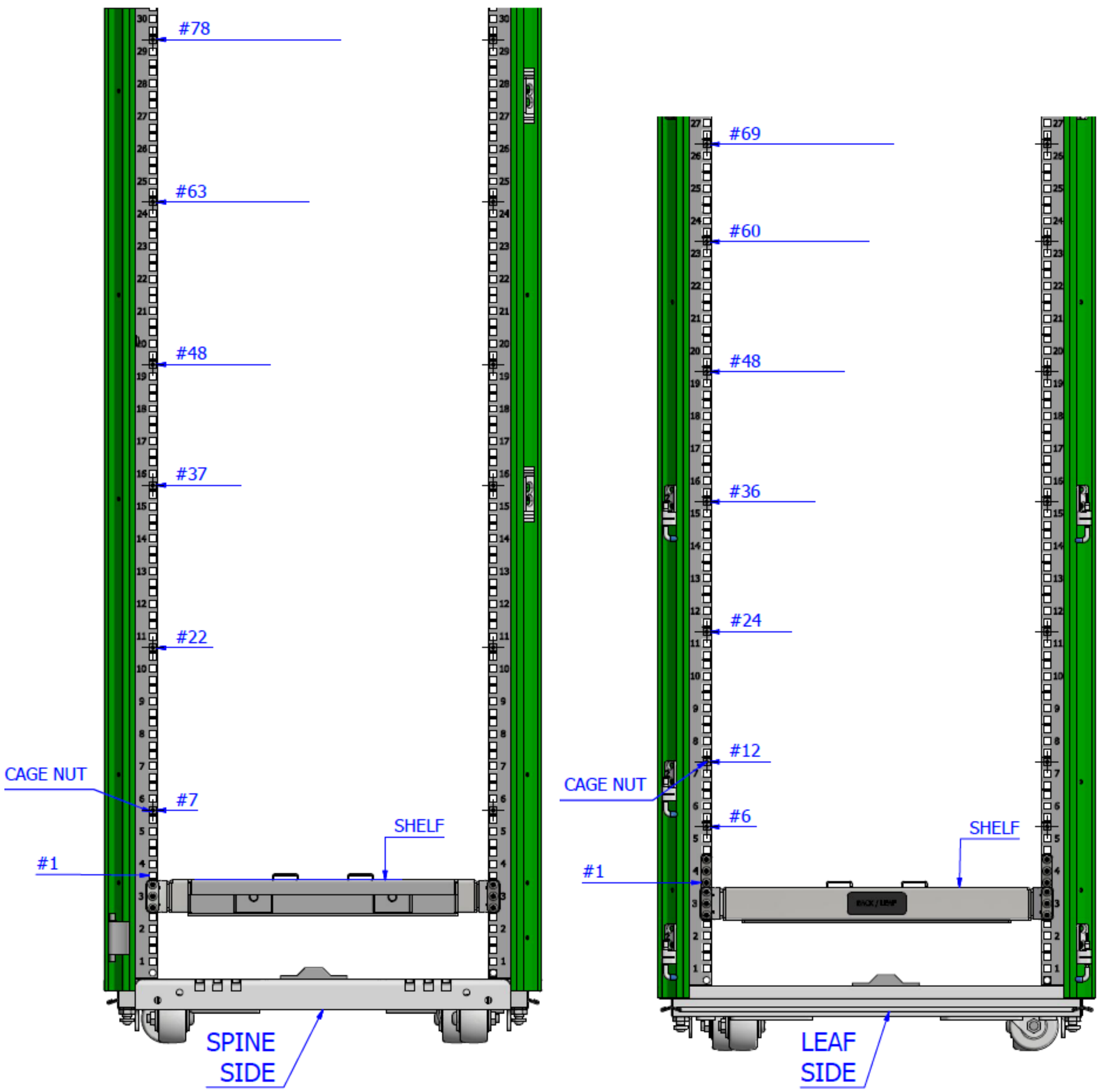


d. Insert 6 M6 cage nuts from the inside of the spine side beams of the rack in the slots indicated in Figure 12.

e. Insert 6 M6 cage nuts from the inside of the leaf side beams of the rack in the slots indicated in Figure 12.

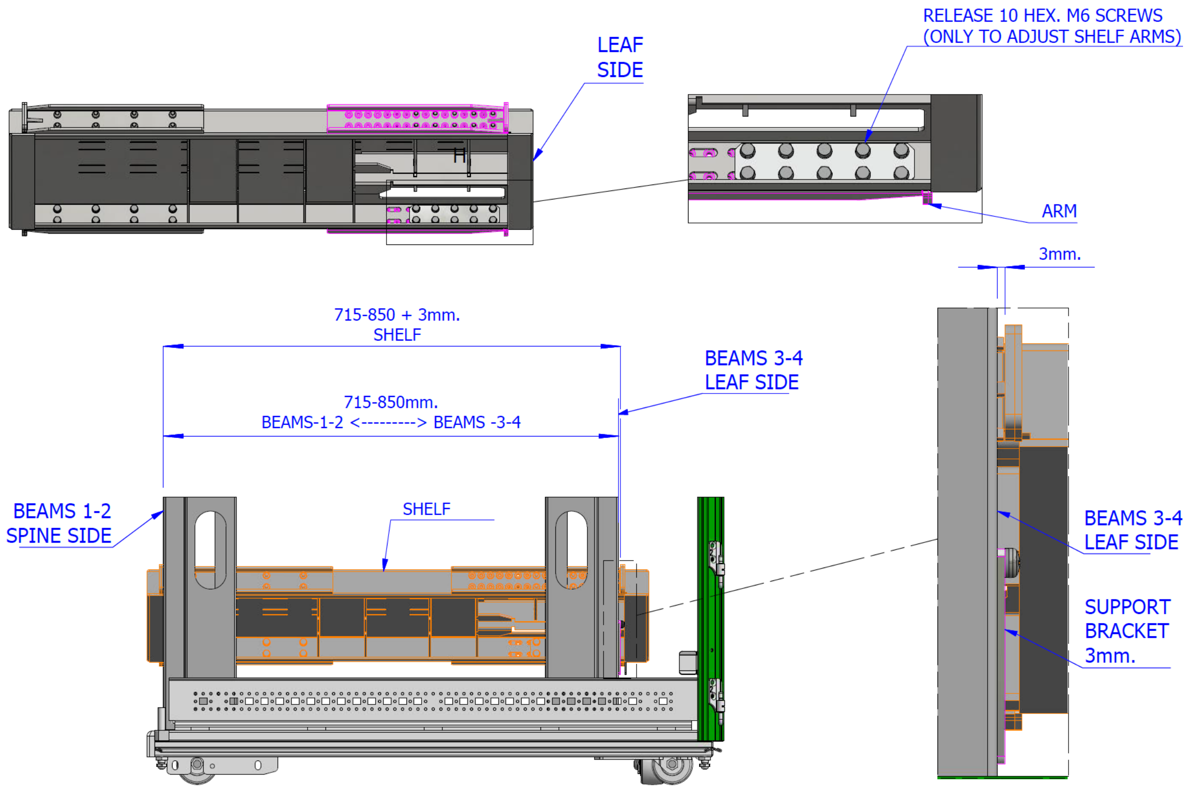
> The indexes in Figure 12 count from the first rack hole above the shelf.

Figure 12: Cage Nut Placement for Switch System Chassis



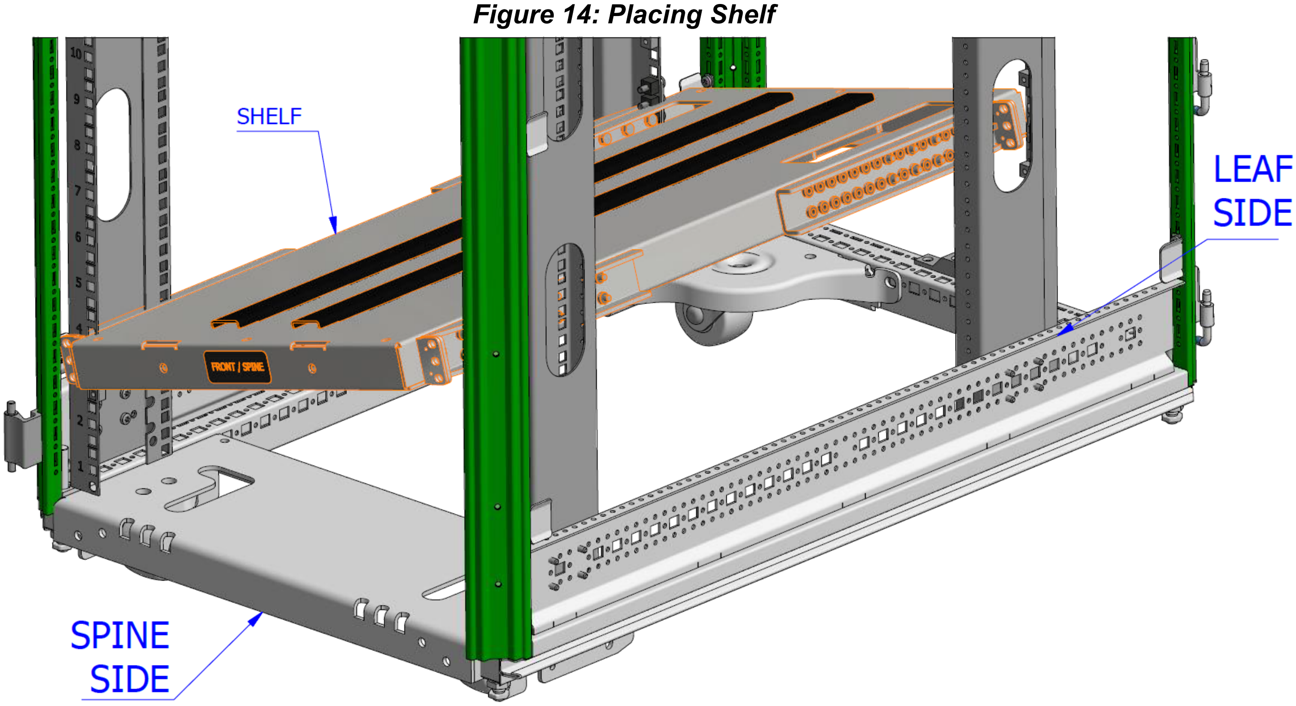
Step 2. Measure the distance between the spine-side and leaf-side beams of the rack and adjust the shelf's leaf-side brackets to that distance while allowing some wiggle room (Figure 13).

Figure 13: Adjusting the Leaf-Side Shelf Brackets



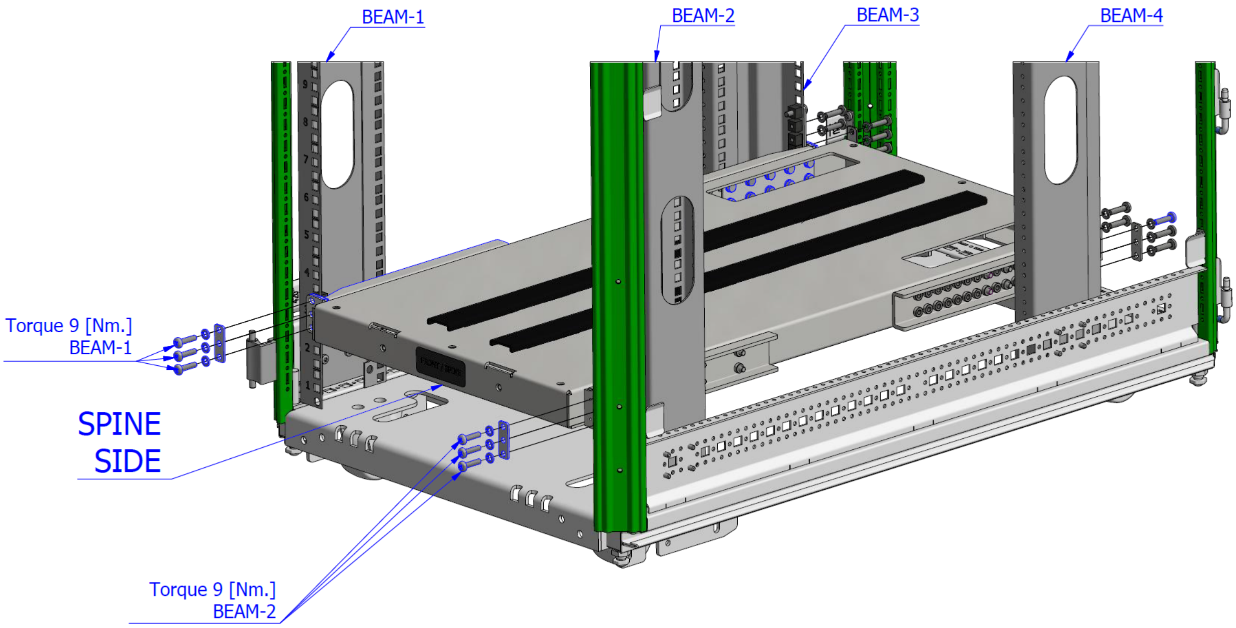
Step 3. Place the shelf in U3 of the rack by inserting it at a tilt (Figure 14).

Figure 14: Placing Shelf



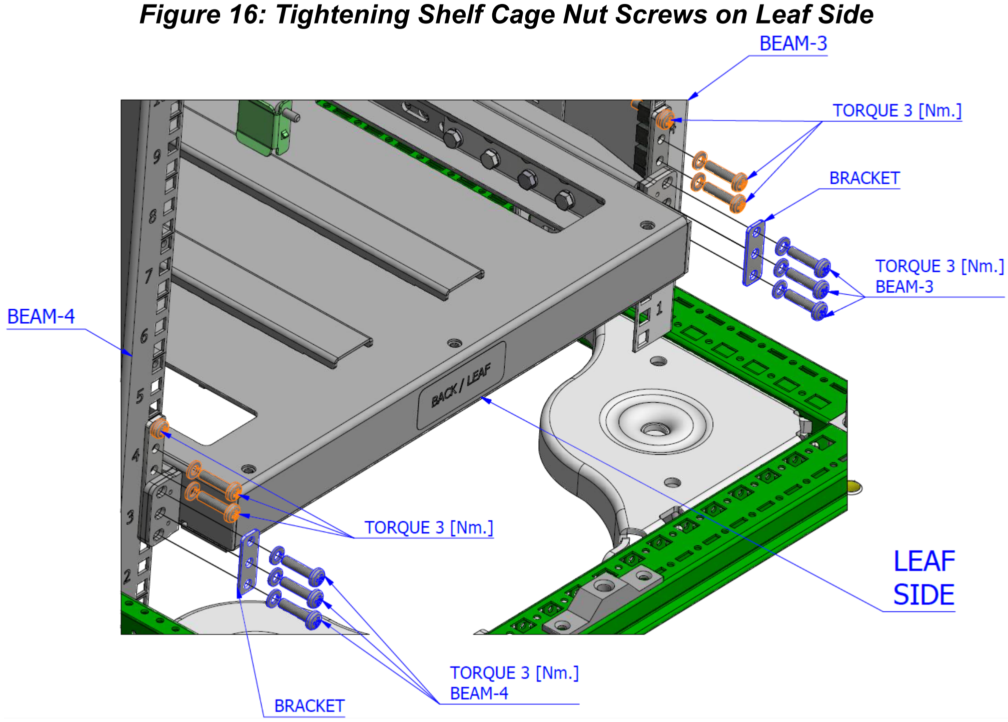
Step 4. Tighten the spine-side M6X25 pan head screws of the brackets to 9Nm torque.

Figure 15: Tightening Shelf Cage Nut Screws on Spine Side



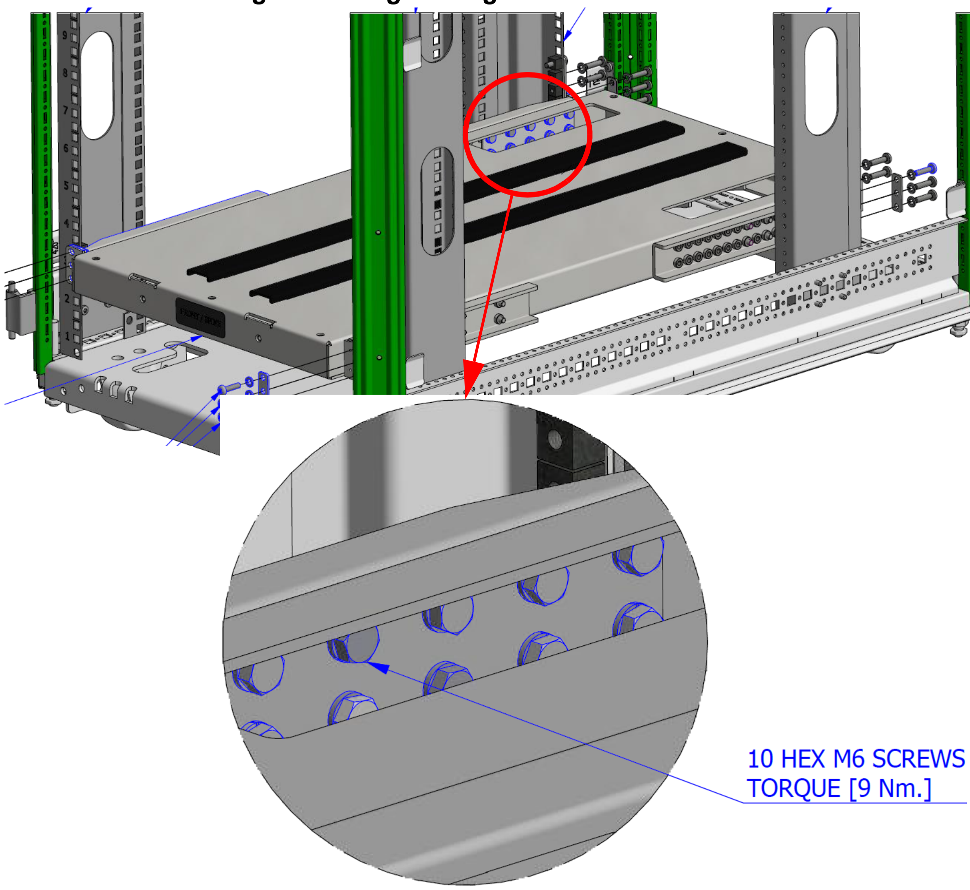
Step 5. Tighten the leaf-side M6X25 pan head screws of the brackets to 3Nm torque.

Figure 16: Tightening Shelf Cage Nut Screws on Leaf Side



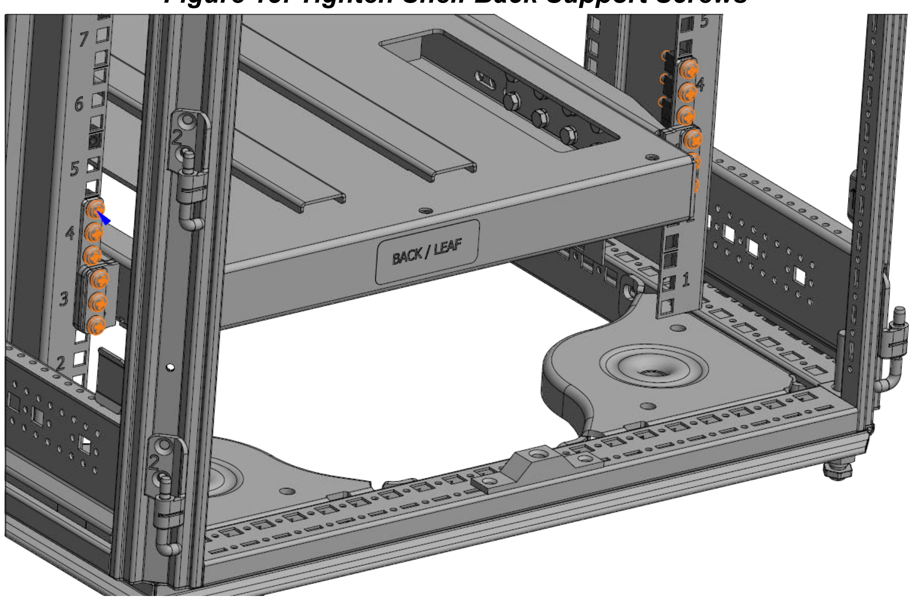
Step 6. Tighten the hex-head screws of the brackets on both sides to 9Nm torque.

Figure 17: Tightening Shelf Bracket Screws



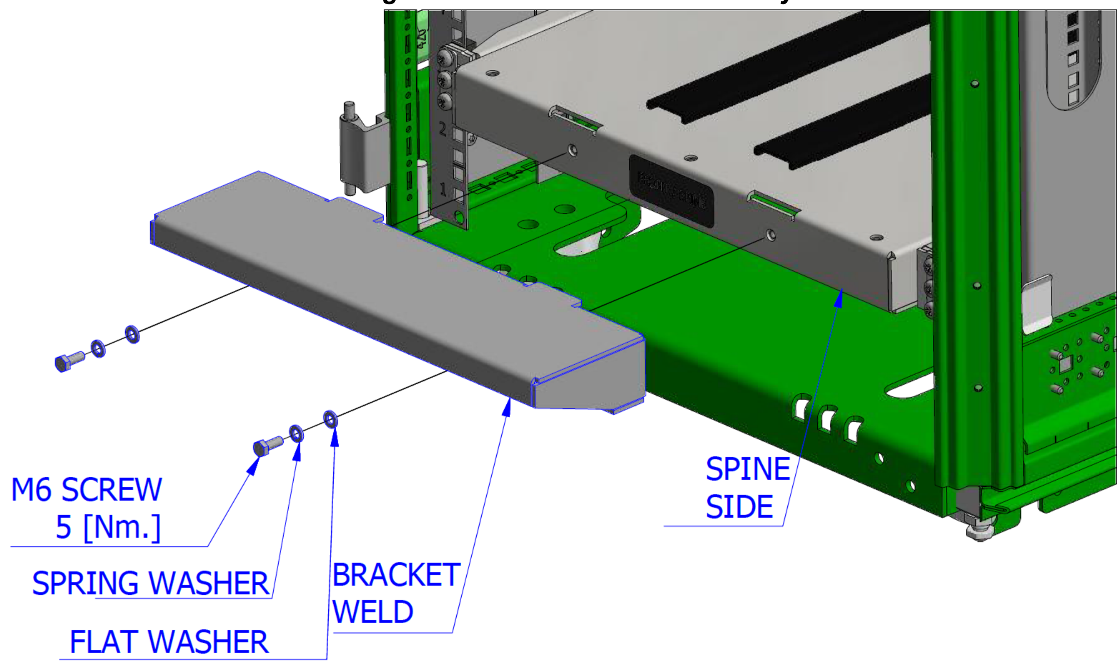
Step 7. Tighten the 12 M6X25 pan head screws of the shelf rear arm bracket to its final torque of 9 Nm torque now that the shelf has been placed.

Figure 18: Tighten Shelf Back Support Screws



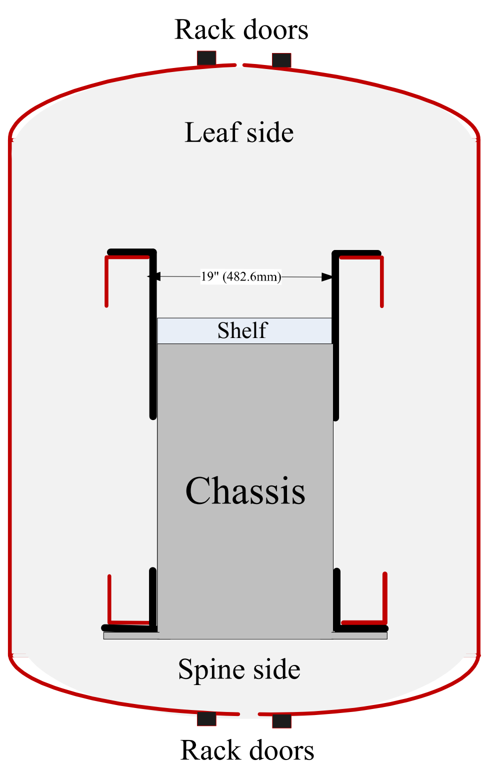
Step 8. Assemble the bracket weld to the shelf on the spine side and tighten with 2 screws, 2 spring washers and 2 flat washers (Figure 19).

Figure 19: Bracket Weld Assembly



Step 9. Before placing the chassis in the rack, make sure to leave more room on the leaf (port cables) side to allow room for cable management.

Figure 20: Placement of Chassis in Rack – Top View



Step 10. Put the crate on the fork lift or a mechanical lift.

Figure 21: Fork Lift

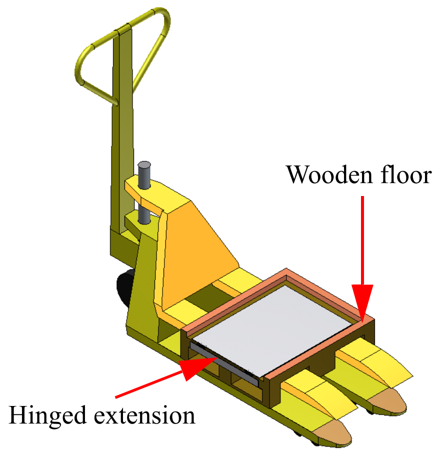
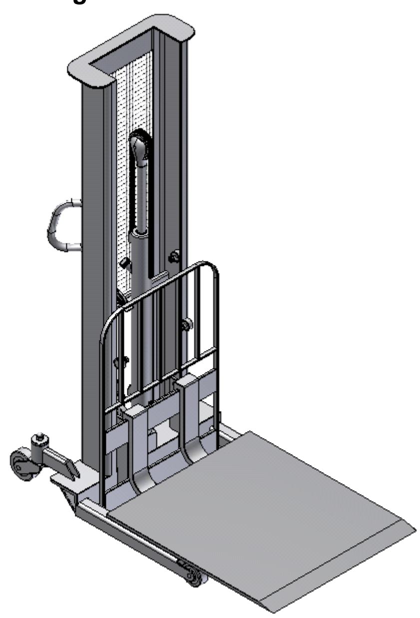


Figure 22: Mechanical Lift



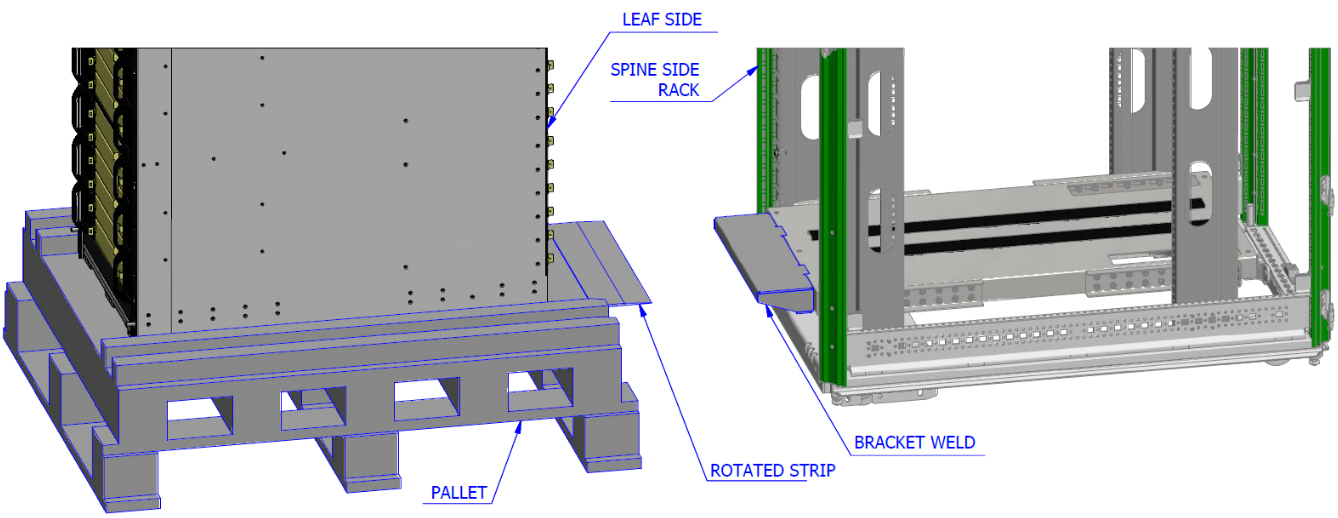
Step 11. Position the chassis in front of the installation rack (Figure 23).

Step 12. Unscrew both lock-down bars.

> The chassis is on ball bearings and can roll easily. Beware that the chassis can roll off of the pallet possibly causing grave bodily harm should it fall on someone.

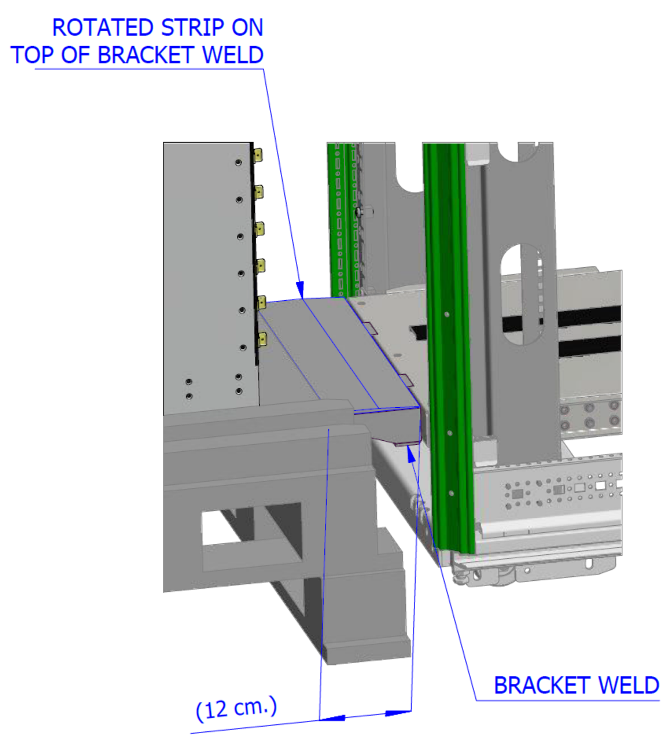
Step 13. Using a fork or mechanical lift, position the middle of the leaf-side of the chassis in front of the spine-side of the rack (Figure 23).

Figure 23: Rack and Chassis Alignment



Step 14. Place the rotated strip on top of the bracket weld (Figure 24).

Figure 24: Rotated Strip and Bracket Weld



Step 15. Unscrew the lock-down bar facing the rack.

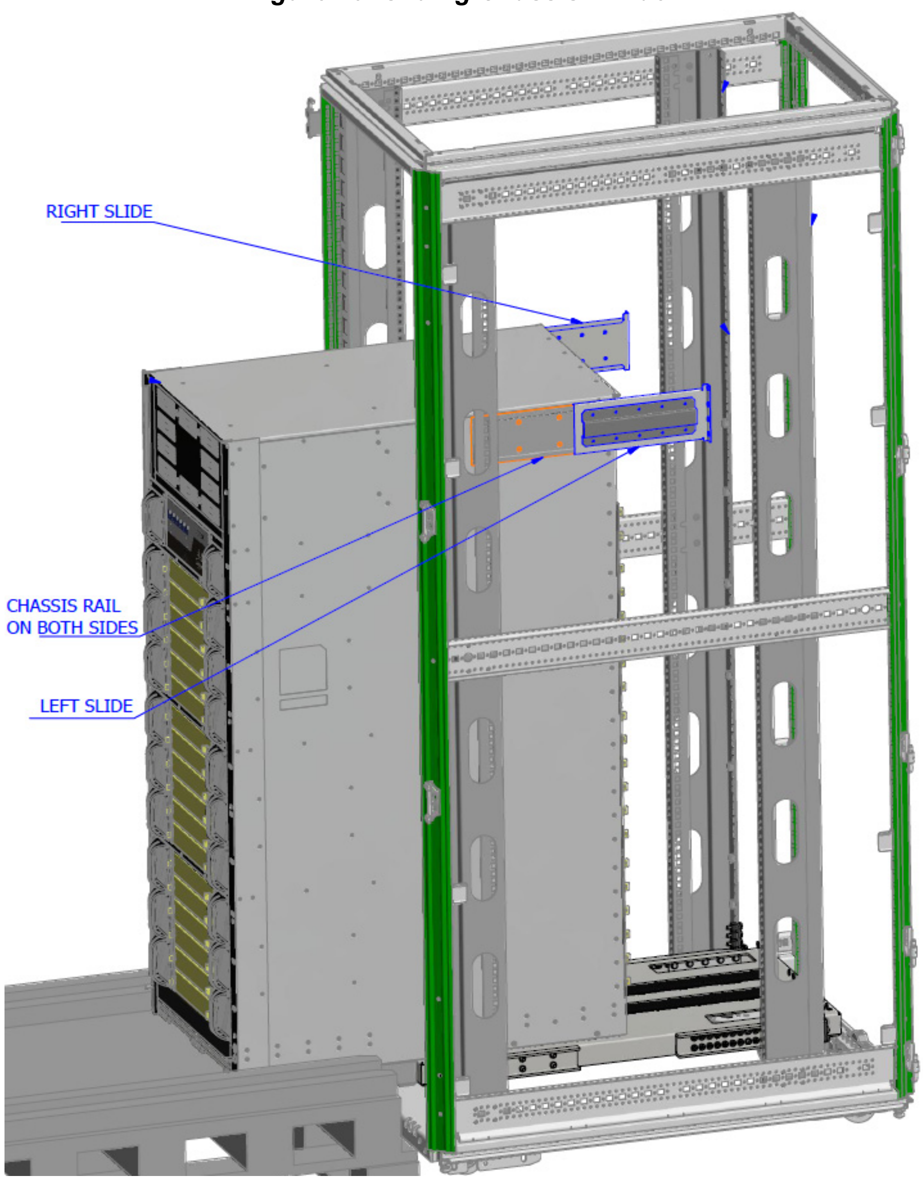
> Note that the chassis is on ball bearings, and with the lock-down bars removed, the chassis can roll off!

Step 16. Slide the switch system chassis half-way into the rack (Figure 25).

> Beware not to injure your fingers during insertion.

Step 17. Slide in the left and right chassis slides (Figure 25).

Figure 25: Sliding Chassis in Rack

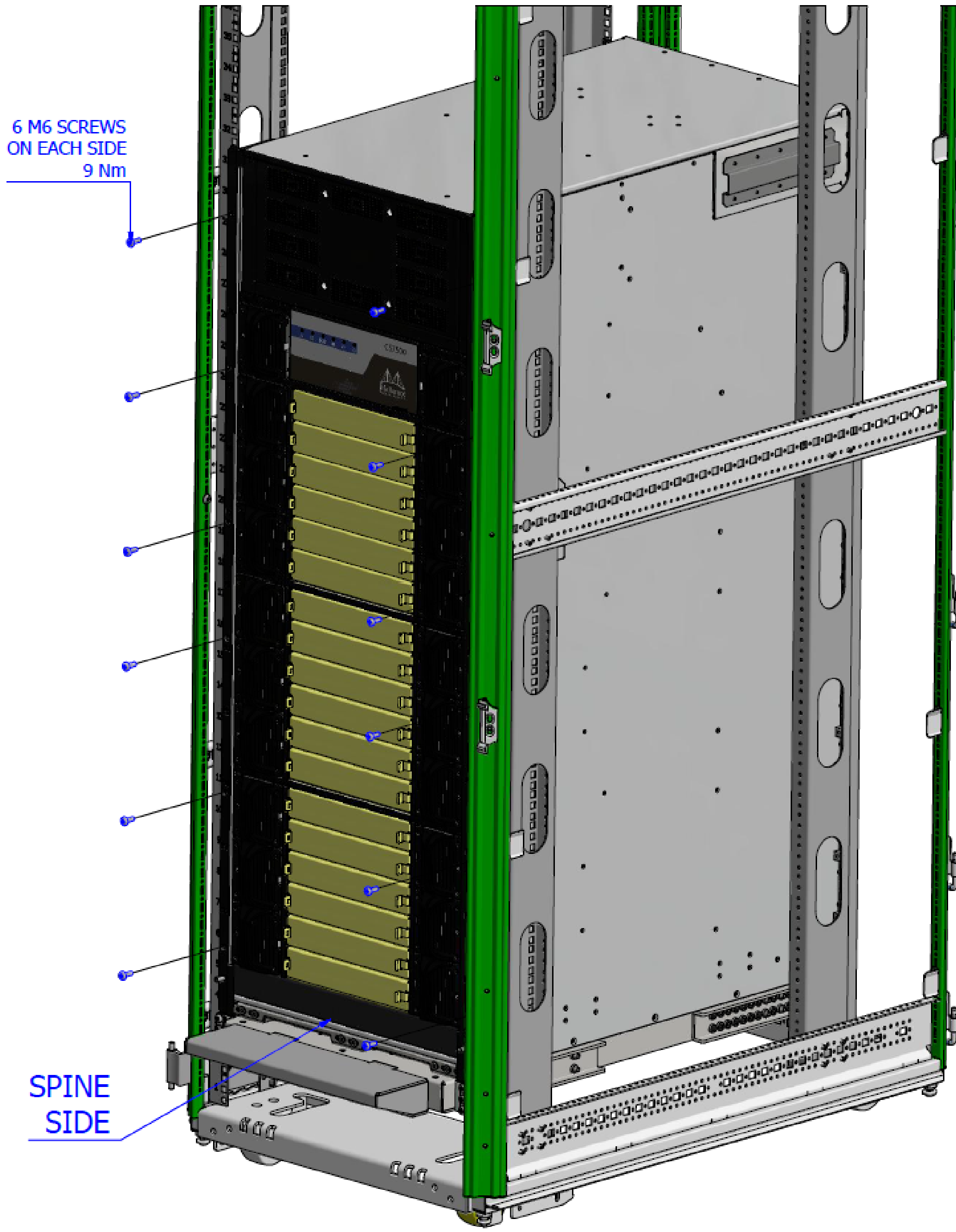


Step 18. Slide the switch system chassis all the way into the rack until it stops.

> Beware not to injure your fingers during insertion.

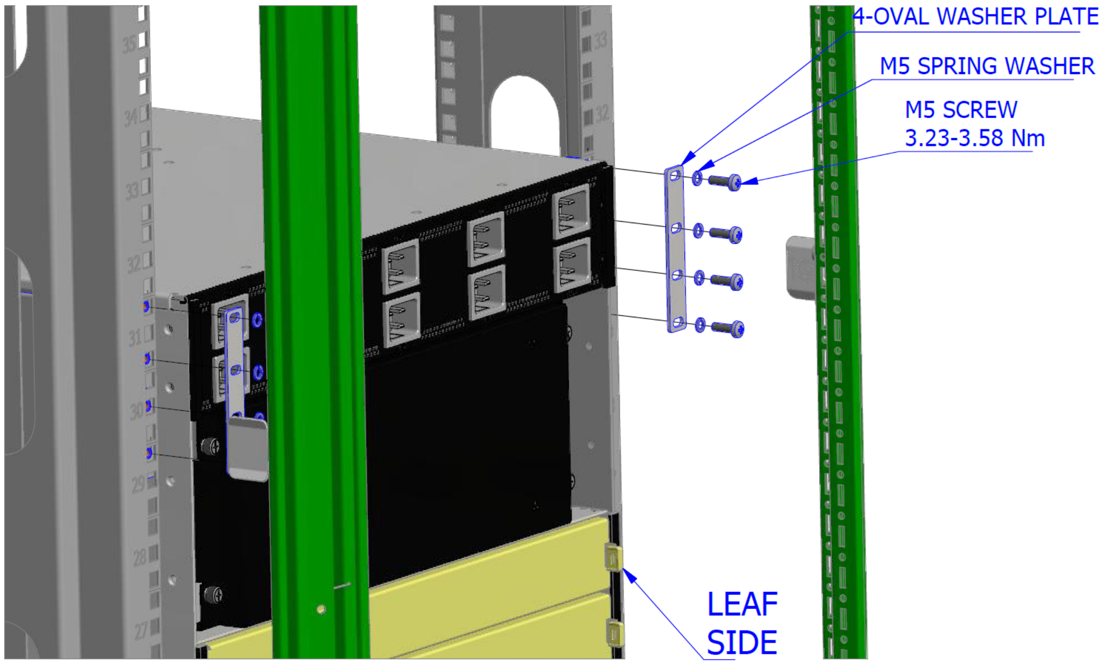
Step 19. Screw the chassis to the rack on the spine side using 12 M6 screws where the cage nuts have been placed (Figure 26).

Figure 26: Screwing the Chassis to the Rack



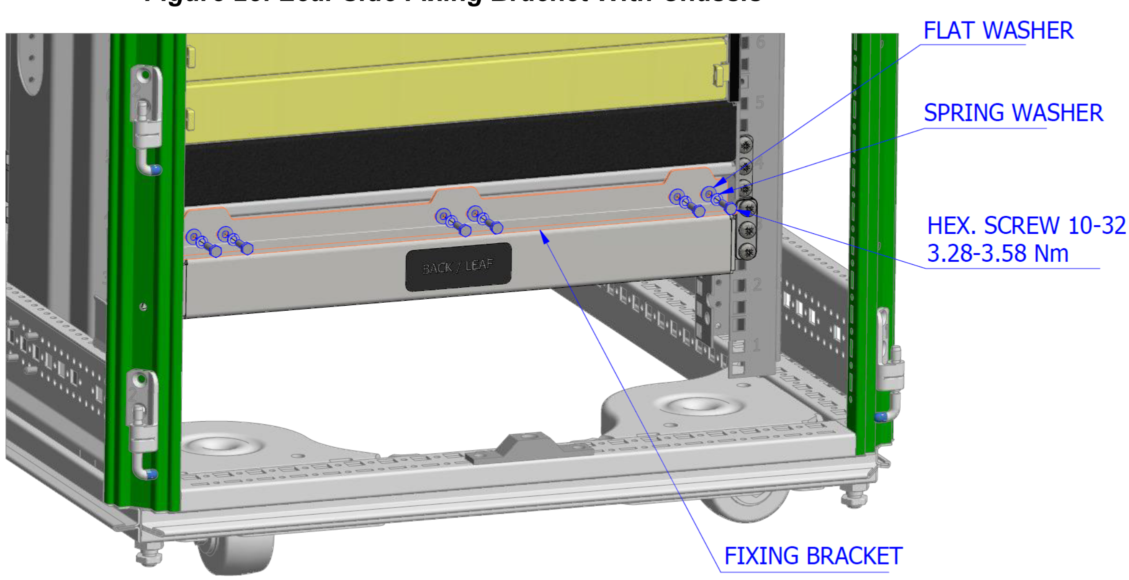
Step 20. Screw the 2 4-oval washer plates to the left and right chassis slides (Figure 27).

Figure 27: Screwing the 4-Oval Washer Plates



Step 21. Place the fixing bracket on the shelf from the leaf side and screw using 10-32 6-hex screws and 6 #10 spring washers to the chassis (Figure 28).

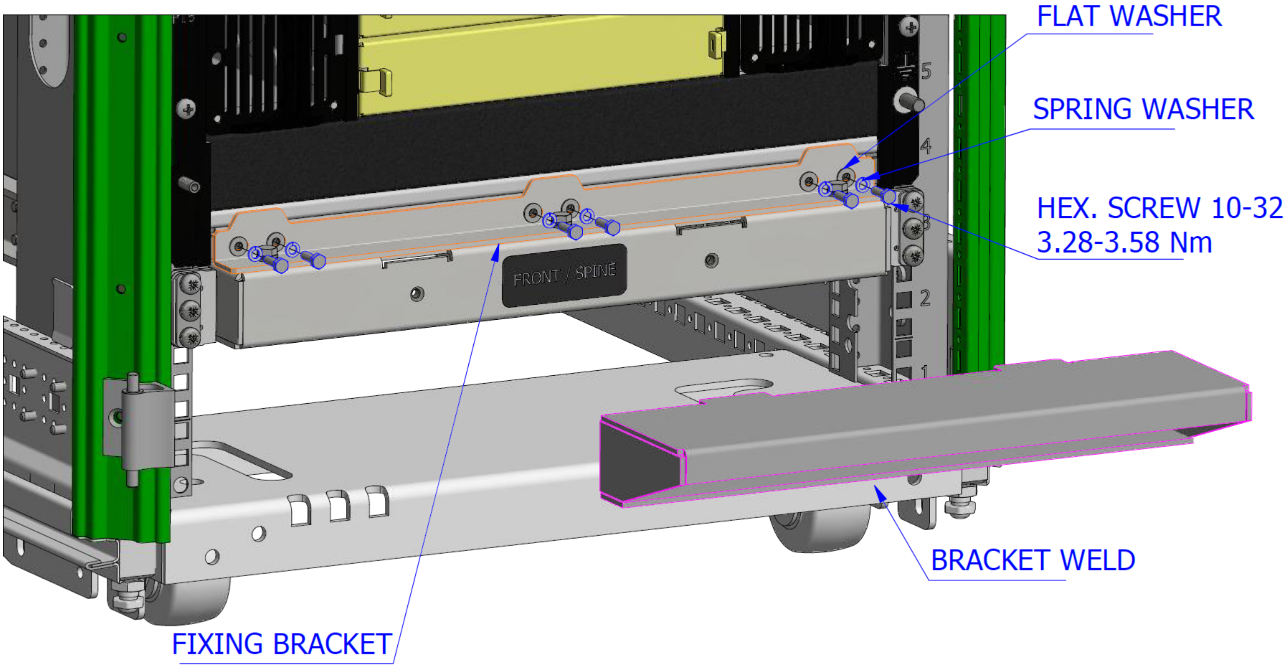
Figure 28: Leaf Side Fixing Bracket With Chassis



Step 22. Remove the bracket weld on the spine side (Figure 29).

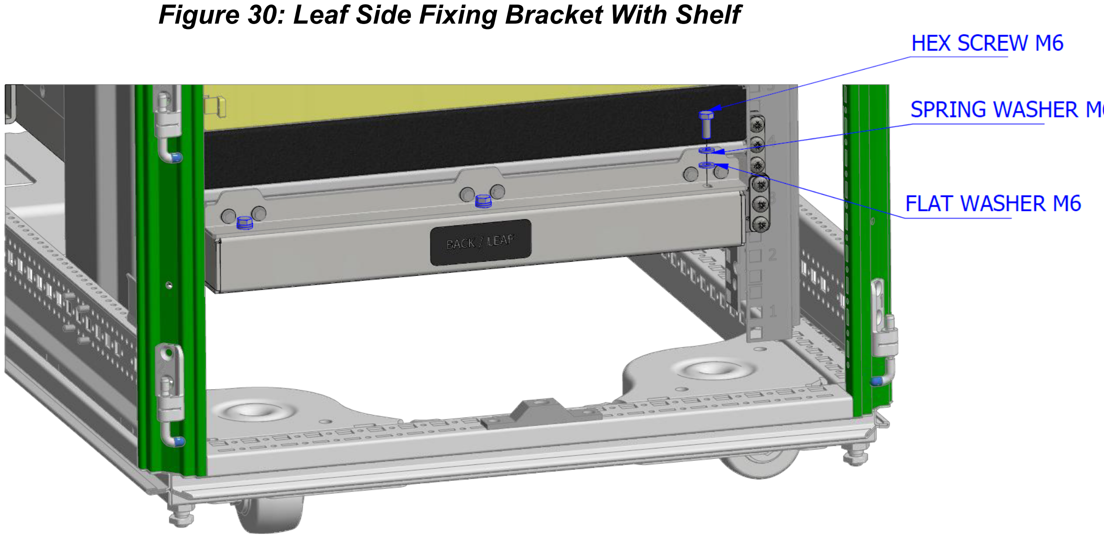
Step 23. Place the fixing bracket on the shelf from the spine side and screw using 10-32 6-hex screws and 6 #10 spring washers to the chassis (Figure 29).

Figure 29: Spine Side Fixing Bracket With Chassis



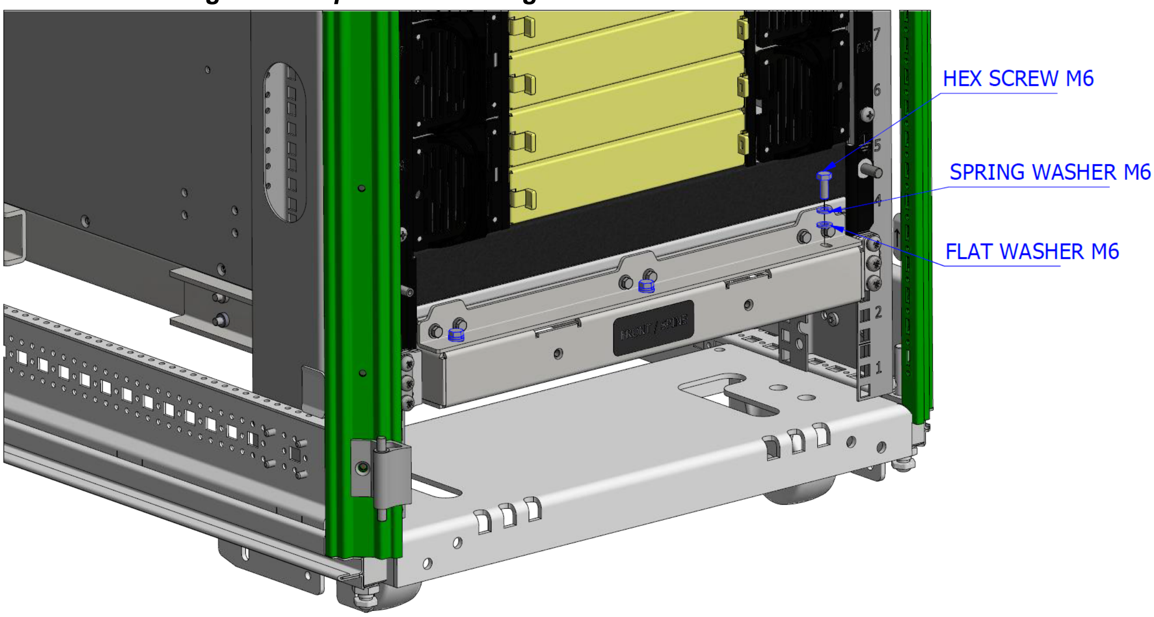
Step 24. Screw the fixing bracket on the leaf side to the shelf at 9 Nm torque (Figure 30).

Figure 30: Leaf Side Fixing Bracket With Shelf



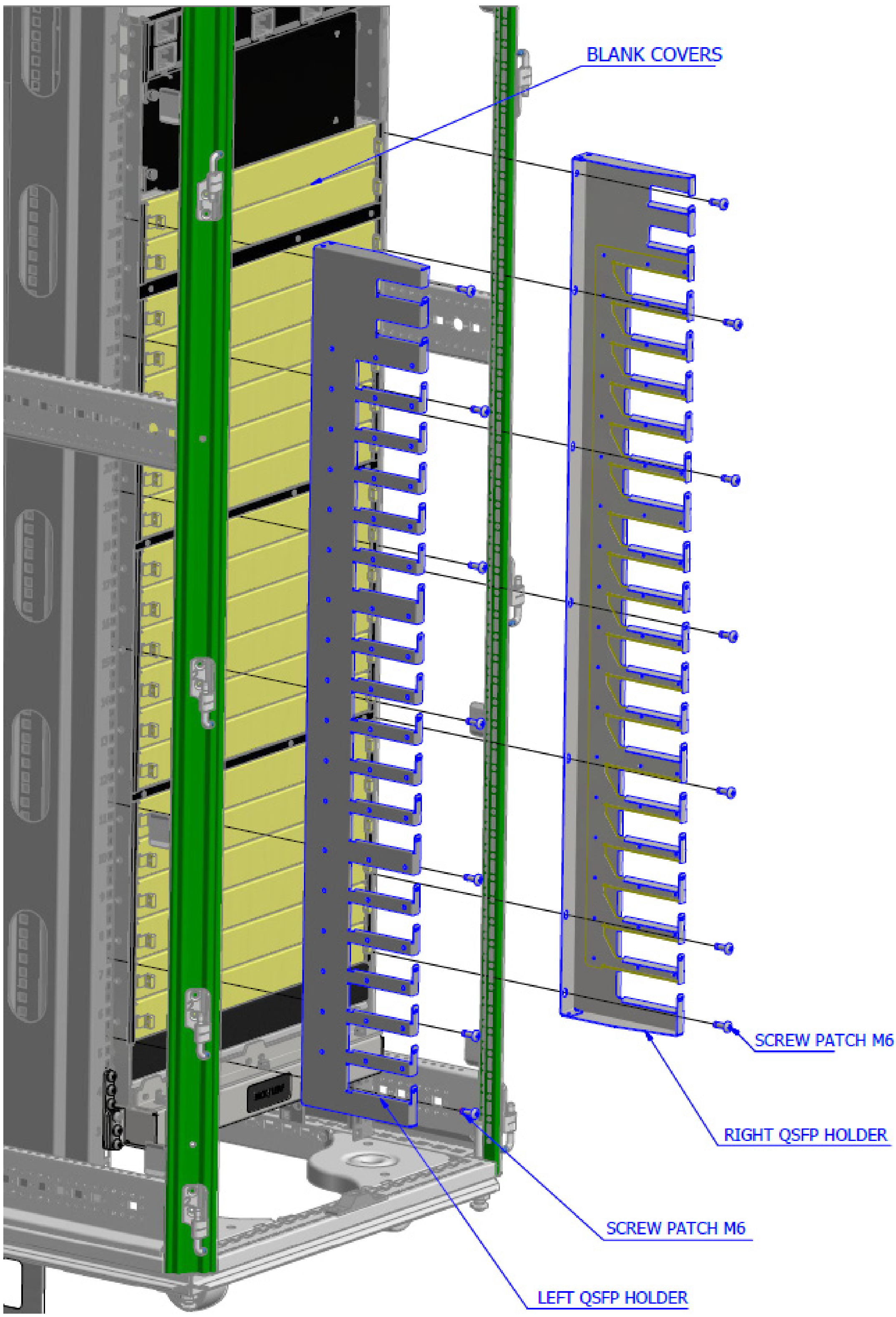
Step 25. Screw the fixing bracket on the spine side to the shelf at 9 Nm torque (Figure 31).

Figure 31: Spine Side Fixing Bracket With Shelf



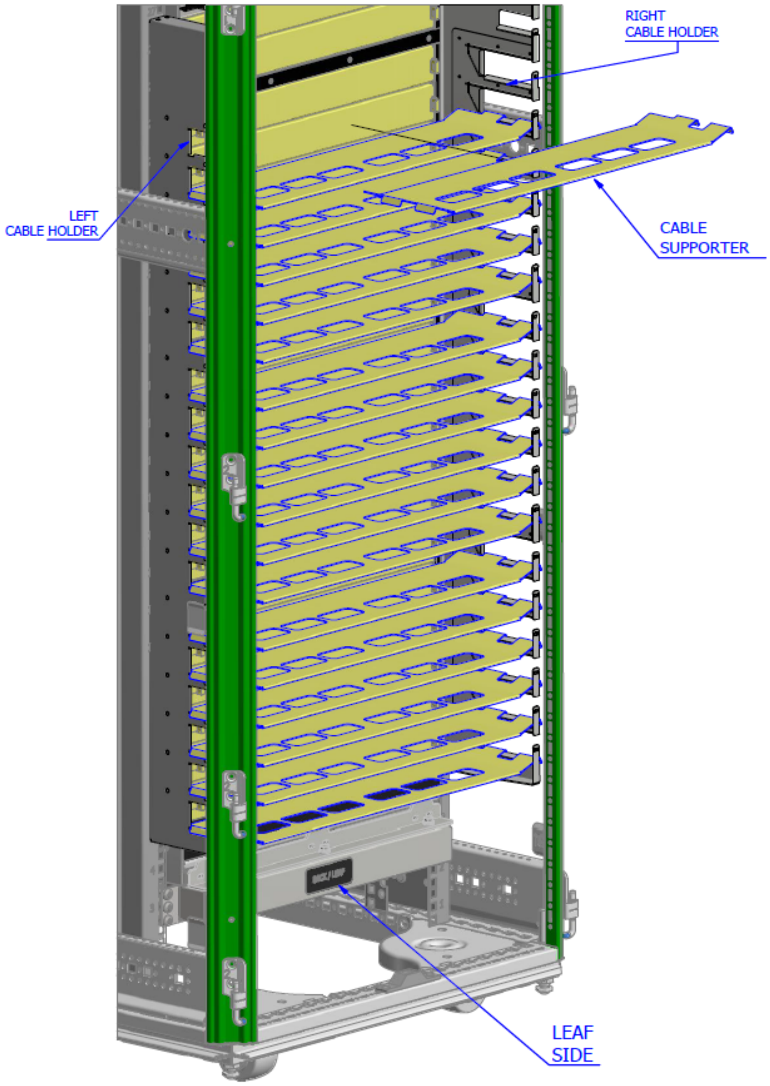
Step 26. Screw the cable holders to the leaf-side rack using 14 M6 pan head screws at 9 Nm torque (Figure 32).

Figure 32: Installing Cable Holders



Step 27. Place the 18 cable supporters onto the cable holders (Figure 33).

Figure 33: Cable Supporter Placement



2.6 Ground Connections

Make sure to connect the ground post to a valid electrical ground. Use a grounding lug and a ground wire of sufficient capacity to safely convey a potential discharge. The grounding post is M-8 with 1.25mm pitch threads. A ground wire of AWG 6 or 4mm diameter is recommended for grounding this device. The chassis is concurrently grounded through each of the PSUs. Only connect the PSU cords to properly grounded outlets. Do not rely on the PSU grounds. It is absolutely necessary to connect the grounding post. Make sure the connections are solid and permanent. If

you choose to not use the ground screw, make sure that the rack is properly grounded and that there is a valid ground connection between the chassis of the switch and the rack.

Warning: System grounding must comply with local electrical code.

Figure 34: Grounding Posts

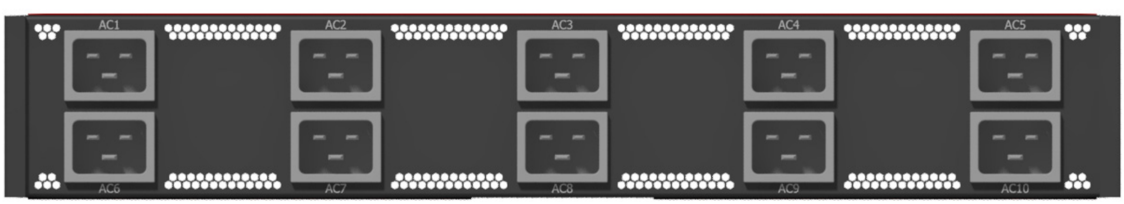


2.7 Power Connections

The switch includes 10 hot-swap power supply units (PSUs). Each PSU has its dedicated AC inlet. The system uses C20 type inlets. The design enables optional use of separate main and backup AC feeds. The AC power source should comply with 180-265VAC 50Hz or 60Hz characteristics.

C19 to C20 type power cords, 15A rated, should be used to connect system to AC power. The maximum power consumption of each power supply is 12A. Ensure all 10 power cords are firmly connected to inlets on the one side and to the AC source on the other.

Figure 35: AC Inlets



Make sure that the power cords are compatible with your outlets. Power cords for different countries can be ordered from Mellanox.

Make sure that the outlets and circuits are not overloaded. Spread out the load over at least two or three circuits or use a 3 phase circuit.

2.8 InfiniBand QSFP Cable Installation

The switch uses industry standard QSFP InfiniBand cables which are available from Mellanox Technologies. The Mellanox proprietary QSFP cables support full 100+100Gb/s (EDR), 56+56Gb/s (FDR), 40+40Gb/s (FDR10), 40+40Gb/s (QDR), 20+20Gb/s (DDR) and 10+10Gb/s (SDR) bidirectional wire speed of the switch ports. All InfiniBand QSFP connections are made to

the leaf modules. Each leaf has 18 InfiniBand QSFP connectors in two rows, which are numbered 1-18. See Section 3.1.7 for port numbering.

> If maximum cable lengths are exceeded data transfer will be reduced and the bit error rate will increase.

> EDR is only guaranteed to work with approved Mellanox cables.

All cables can be inserted or removed with the unit powered on. To insert a cable, press the connector onto the port receptacle until the connector is firmly seated. The orange LED indicator above the port will light when the physical connection is established (when both ends of the cable are properly connected to working devices). Allow 15 seconds for link to get up. To remove, disengage the lock and slowly pull the connector away from the port receptacle.

> For a valid physical connection both ends of the cable must be connected to working devices.

> Careful to not impede the airflow through the ventilation holes next to the InfiniBand ports. Use cable lengths which allow routing horizontally around to the side of the chassis before bending upward or downward in the rack.

2.8.1 Supported Approved Cables

For a list of approved cables for this switch see the Mellanox approved cable list.

http://www.mellanox.com/page/cables?mtag=cable_overview

2.8.2 Cable Power Classes

Chassis and switches need to be able to dissipate the heat generated by high power I/O cables and modules. The Mellanox CS75x0 series chassis are rated for cables up to class 4 as per the SFF committee classification (SFF-8436.PDF).

2.9 Hot Swap Insertion and Extraction

Before starting any procedure on the CS7500 switch system, put an ESD prevention wrist strap on your wrist and connect to the chassis.

> Do not mix replacement parts based on different generations of chip.
> All replacement modules must be consistent with the chassis family and switch chip generation.

> When hot-swapping any of the units, it is necessary to wait 1 minute after removing the defective part before inserting the new part. This is necessary so that the management module will start a new cycle checking through the leafs and spines for the FW versions.

This switch platform supports hot swap capabilities for the following parts:

- Power supply units
- Leaf modules
- Spine modules
- Leaf fan modules
- Spine fan modules
- Management modules

2.9.1 Power Supply Units

The power supplies deliver 2500W at $48V_{DC}$. The input to each of these power supplies requires 12A current in order to output 2500W.

For N+N configuration up to half of the PSUs can go down and the system will continue to run.

The power required to run the switch system is equally divided between all of the working PSUs.

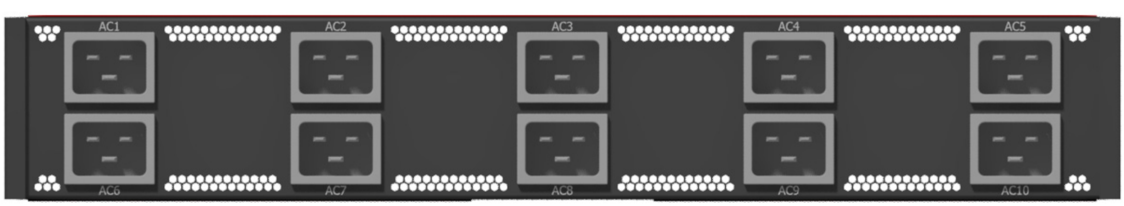
2.9.1.1 Extracting and Inserting the PSU

With all of the N+N 2500W power supplies installed, the system is in N +N redundant configuration, half of the PSUs may be extracted without bringing down the system.

➢ ***To extract a PSU:***

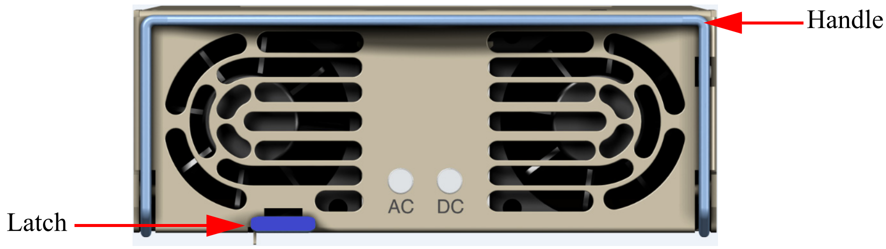
1. Determine which AC connector on the connector side of the chassis corresponds to the defective PSU.
2. Remove the power cord from the PSU's inlet. Note which power cord it is according to the AC numbering.

Figure 36: Power Unit AC Inlet Numbering



3. On the spine side of the chassis, remove the cover to the PSUs. There are four Phillips head screws for the cover plate.

Figure 37: Power Supply Unit



4. Grasping the handle with one hand, push the black latch release while pulling the handle outward. As the PSU unseats, the PSU status indicators will turn off.
5. Remove the PSU.

➢ ***To insert a power supply unit:***

1. Make sure the mating connector of the new unit is free of any dirt and/or obstacles.
2. Insert the PSU by sliding it into the opening until a slight resistance is felt.
3. Continue pressing the PSU until it seats completely. The latch will snap into place confirming the proper installation.
4. Insert the power cord into the supply connector on the other side of the chassis.
5. Replace the cover over the PSUs.

The green indicators should light. If not, extract the PSU and re-insert it again.

2.9.2 Leaf Modules

When hot-swapping any of the units, it is necessary to wait 1 minute after removing the defective part before inserting the new part. This is necessary so that the management module will start a new cycle checking through the leafs and spines for the FW versions.

Leaf module slots are numbered from top to bottom from L1 to L18 on both sides of the chassis.

2.9.2.1 Extracting a Leaf Module

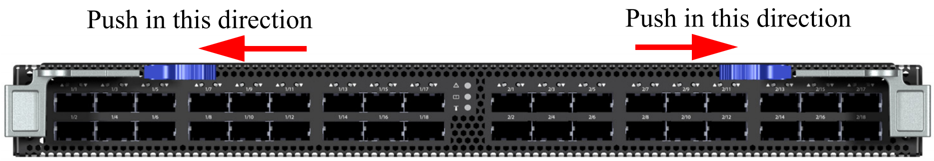
Each leaf module has 2 ejector handles that locks the module in place and serve as a lever for seating or extracting (see Figure 38).

1. Run the shut down command **"no power enable <module>".** For example to shut down leaf 16 run the command below.

```
switch [master] (config) # no power enable L16
```

2. Disconnect all cables connected to the leaf.
3. Push the ejector handles in the direction of the red arrows in Figure 38 and pull them outwards to unlock the ejectors from the chassis.

Figure 38: Releasing Leaf Ejector Handles



4. Open the ejectors until it is 45 degrees from the leaf.
5. Pull out the module half-way through the guiding rails using the ejector handles.
6. Re-lock the ejector handles.
7. Hold the body of the leaf on both sides and remove it from the chassis.

The module is short, therefore do not let go of it while sliding it out.

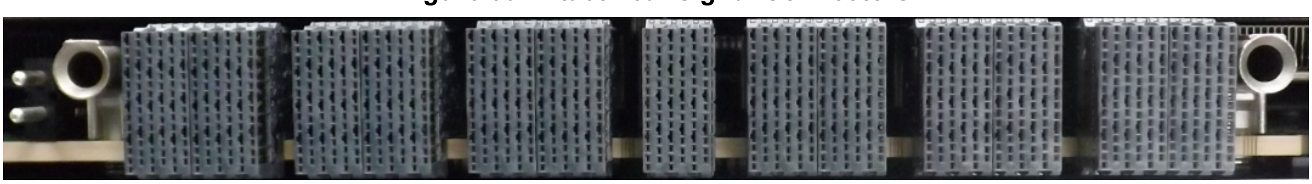
2.9.2.2 Inserting a Leaf Module

When hot-swapping any of the units, it is necessary to wait 1 minute after removing the defective part before inserting the new part. This is necessary so that the management module will start a new cycle checking through the leafs and spines for the FW versions.

To insert the leaf module:

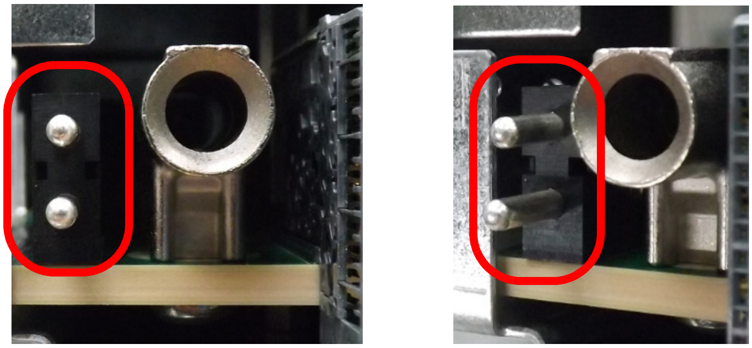
1. Check for foreign objects in or mechanical damage to the chassis leaf slots.
2. Check leaf mechanics for any noticeable damage.
3. Check back signal connectors' integrity. Look for any broken signal dividers or any deviations from the pass criterion shown in Figure 39.

Figure 39: Intact Leaf Signal Connectors



4. Check power connector's integrity. Look for any damage on the power connector casing or blades damage.

Figure 40: Intact Leaf Power Pins



5. Start with the ejector handles fully open; that is, at 45 degrees to the front panel of the leaf.
6. Holding the leaf by its sides, carefully set the leaf module into the chassis.
7. Applying equal pressure on both sides of the leaf module, slowly slide the module into the chassis until the ejector handles reach the vertical bar.

> Do not apply excessive force to slide in the leaf module. If you feel resistance, remove the leaf module and double check both the chassis and leaf for any damage.

8. Catch the ejector hooks onto the vertical bar of the chassis and push the ejector handles shut.
9. Lock the ejector handles onto the module.

2.9.3 Spine Modules

> Do NOT mix replacement parts based on different generations of chip.
> All replacement modules must be consistent with the chassis family and switch chip generation.

> When hot swapping any of the units, it is necessary to wait 1 minute after removing the defective part before inserting the new part. This is necessary so that the management module will start a new cycle checking through the leafs and spines for the FW versions.

Each spine has a pair of ejectors that lock the module in place and serve as levers for seating or extracting (see Figure 42).

Management module 1 is connected to spine module 1, and management module 2 is connected to spine module 2. All of the spine modules can be hot-swapped when these two management modules are installed and working.

> When a slave management module is not installed or not working, the spine module connected to the master management module cannot be hot-swapped.

Spine module slots are numbered from top to bottom from S1 to S18 on both sides of the chassis.

2.9.3.1 Extracting a Spine Module

> When a slave management module is not installed or not working, hot-swapping the spine module connected to the master management module will cause the chassis to crash.

> Neither the CLI nor the GUI management tools will allow you to shut down spine #1 or spine #2, as the management modules are connected to the chassis components through these spines.

Extracting Spine Module #1 or #2

Spine module #1 is connected to management module #1 and spine module #2 is connected to management module #2.

Figure 41: Management Module Numbering



> Removing spine #1 causes management module #1 to reset.
> Removing spine #2 causes management module #2 to reset.

> **Warning**: If the spine you want to hot swap is connected to the master management module the management module will **reboot** when you take out the spine.
> **If you have only one management module the chassis will crash!**

If you need to hot swap spine #1 or spine #2:

1. Check to see if the spine you need to remove is connected to the master management module. See Figure 41.
2. Follow the steps in the section below.

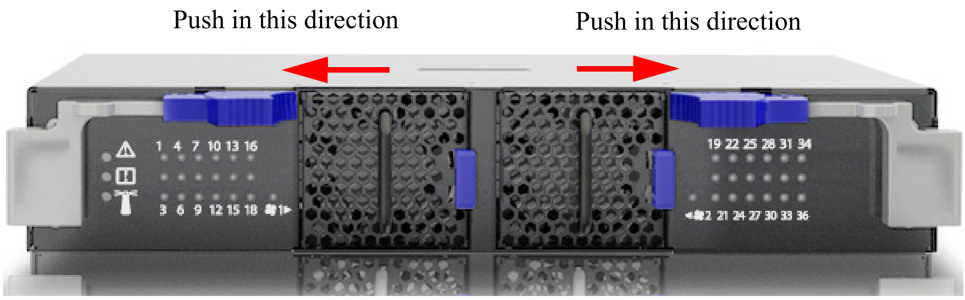
Extracting Spine Modules Except #1 or #2

1. Run the shut down command no power enable <module>. For example to shut down spine 06 run the command below.

```
switch [master] (config) # no power enable S06
```

2. Push the ejector handles in the direction of the red arrows in Figure 42 and pull them outwards to unlock the ejectors from the chassis.

Figure 42: Releasing Spine Ejector Handles



3. Open the ejectors until they are at a 45 degree angle from the module.

> Do not use the fan FRU handle to extract the spine module.

4. Pull out the module half-way through the guiding rails using both ejectors.
5. Re-lock the ejector handles.
6. Hold the body of the module on both sides and remove it from the chassis.

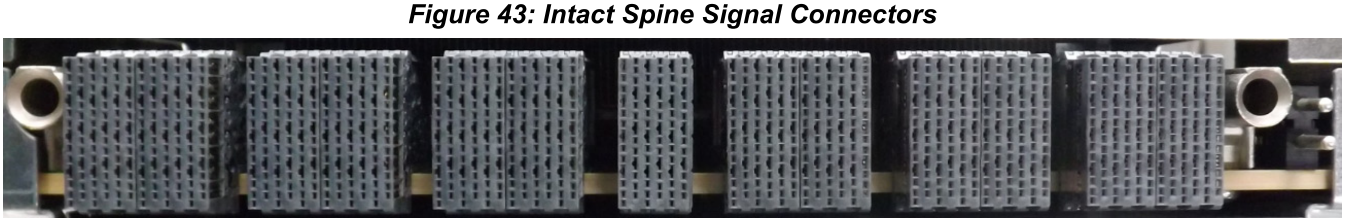
2.9.3.2 Inserting a Spine Module

> When hot-swapping any of the units, it is necessary to wait 1 minute after removing the defective part before inserting the new part. This is necessary so that the management module will start a new cycle checking through the leafs and spines for the FW versions.

To insert a spine module:

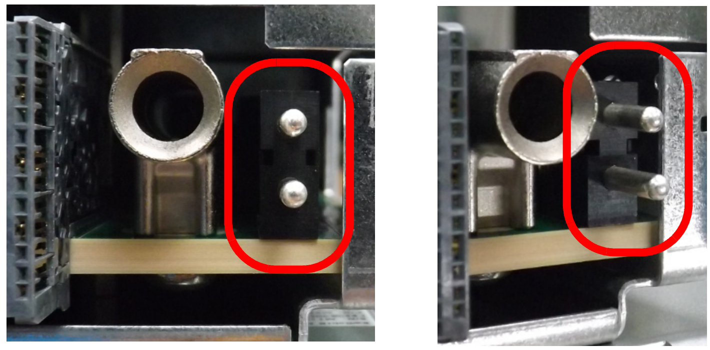
1. Check for foreign objects in or mechanical damage to the chassis spine slots.
2. Check back signal connectors' integrity. Look for any broken signal dividers or any deviations from the pass criteria shown in Figure 43.

Figure 43: Intact Spine Signal Connectors



3. Check power connector's integrity. Look for any damage on the power connector casing or blades damage, or any deviations from the pass criterion shown in Figure 44.

Figure 44: Intact Spine Power Pin Holders



4. Start with the ejector handles fully open; that is, at 45 degrees to the front panel of the spine.

> Do not use the fan FRU handle to insert the spine module.

5. Holding the spine by its sides, carefully set the spine module into the chassis.
6. Using only the ejector handles, slowly slide the module into the chassis until the hooks reach the vertical bar.

> Do not apply excessive force to slide in the spine module. If you feel resistance, remove the spine and double check both the chassis and spine for any damage.

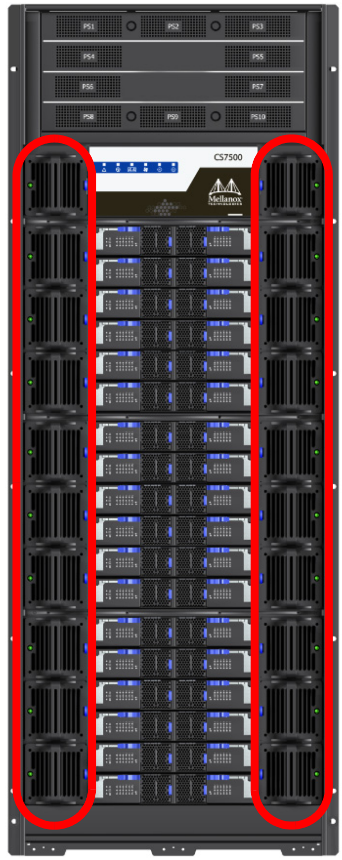
7. Catch the hooks onto the vertical bar of the chassis and push the ejector handle shut.
8. Lock the ejector handles onto the module.

2.9.4 Fan Modules

2.9.4.1 Leaf Fan Module

There are 20 fan modules on the chassis for the leaf and management modules. They are located on the spine side of the chassis with 10 on the right of the spines, and 10 on the left. When a fan module is not functioning the status LED on the fan will light up in amber. Airflow through the spines is independent of the airflow through the leafs.

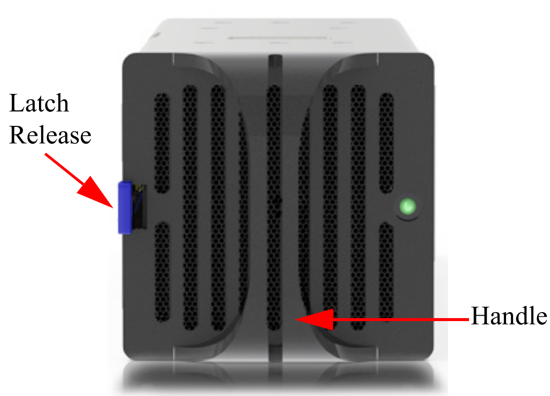
Figure 45: Leaf Fan Locations on the Chassis



Extracting the Leaf Fan Module

1. Push and hold the blue latch release. See Figure 46.
2. Slowly pull out the fan module using the handle.

Figure 46: Leaf Fan Module Extraction



Inserting the Leaf Fan Module

> When hot-swapping any of the units, it is necessary to wait 1 minute after removing the defective part before inserting the new part. This is necessary so that the management module will start a new cycle checking through the leafs and spines for the FW versions.

1. Confirm that the location of the connector in the chassis lines up with the connector in the fan module.
2. Slowly slide in the new leaf fan module.

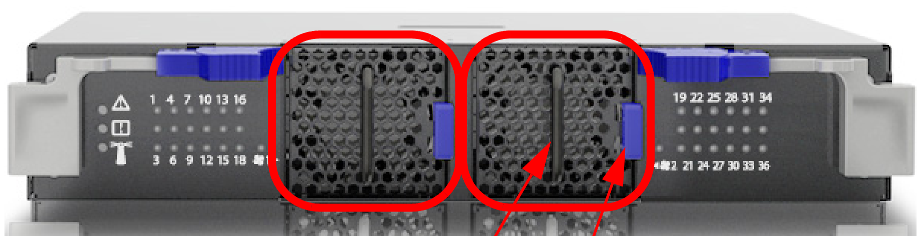
> If the fan module stops before it goes in all of the way it is inserted incorrectly.

3. Push the fan module until the latch engages.
4. Make sure that the green fan LED on the module comes on (indicating that fan is running).

2.9.4.2 Spine Fan Modules

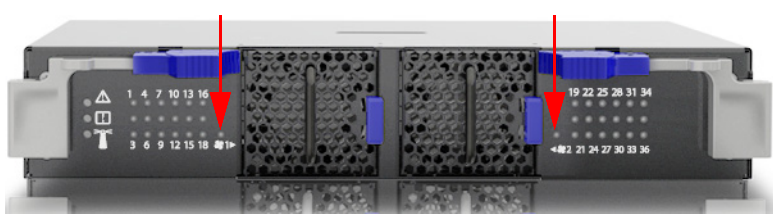
Each spine has 2 individual fan modules that contain 2 individual fans each. Should a single fan fail the fan status LED on the spine and the fan status LED on the management module light up, indicating the necessity to replace the fan module. Airflow through the spines is independent of the airflow through the leafs.

Figure 47: Spine Fan Modules



When a fan module is removed the indicator light will reset.

Figure 48: Fan Status LED on the Spine Module



Extracting the Spine Fan Module

To extract the spine fan module push the blue latch button while pulling the fan module out.

Inserting the Spine Fan Module

When hot-swapping any of the units, it is necessary to wait 1 minute after removing the defective part before inserting the new part. This is necessary so that the management module will start a new cycle checking through the leafs and spines for the FW versions.

1. Make sure the fan module is oriented correctly with the release latch on the right. Confirm that the location of the connector in the chassis will line up with the connector in the fan module.
2. Slowly slide in the new spine fan module.
3. Push the fan module as far as it will go, make sure the locking latches engage.

If the fan LED continues to show amber remove the fan module and check the pins on the connector inside of the spine to make sure that none of them are bent.

2.9.5 Management Module

When hot-swapping any of the units, it is necessary to wait 1 minute after removing the defective part before inserting the new part. This is necessary so that the management module will start a new cycle checking through the leafs and spines for the FW versions.

Extracting a Management Module

Management modules are located on the leaf side, above the leafs. There are two slots to install the management modules.

Only one management module is required to run the switch system.

If only one management module is used, the other management slot should be covered using a management blank unit.

Each management module has a pair of ejectors that lock the module in place and serve as a lever for seating or extracting (see Figure 49).

1. Run the shut down command `no power enable <module>.` For example to shut down management module 2, run.

```
switch [master] (config) # no power enable mgmt2
```

2. Disconnect all cables connected to the management module.
3. Push the ejector handles in the direction of the red arrows in Figure 49 and pull them outwards to unlock the ejectors from the chassis.

Figure 49: Releasing Management Ejector Handles



4. Open the ejectors until they are 45 degrees from the module.
5. Pull out the module half-way through the guiding rails using the ejector handle.
6. Lock the ejector handle.
7. Hold the body of the module on both sides and remove it from the chassis.

> The module is short, therefore do not let go of it while sliding it out.

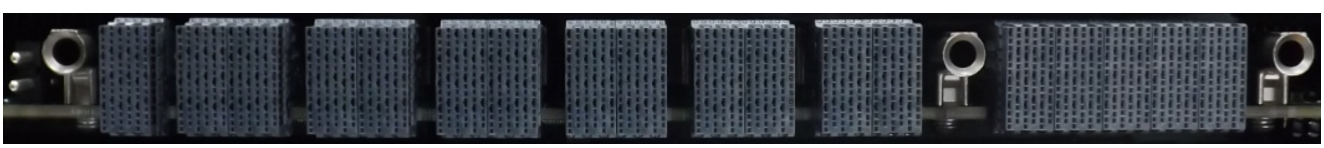
Inserting a Management Module

> When hot-swapping any of the units, it is necessary to wait 1 minute after removing the defective part before inserting the new part. This is necessary so that the management module will start a new cycle checking through the leafs and spines for the FW versions.

To insert a management module:

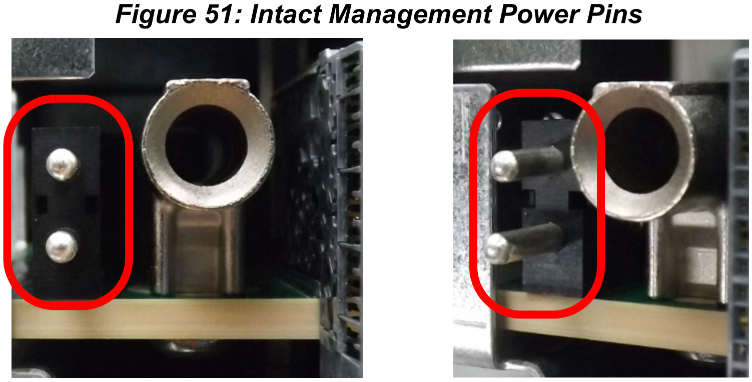
1. Check for foreign objects in or mechanical damage to the chassis management slots.
2. Check management mechanics for any noticeable damage.
3. Check back signal connectors' integrity. Look for any broken signal dividers or any deviations from the pass criterion shown in Figure 50.

Figure 50: Intact Signal Connectors



4. Check power connector's integrity. Look for any damage on the power connector casing or blades damage, or any deviations from the pass criterion shown in Figure 51.

Figure 51: Intact Management Power Pins



5. Start with the ejector handles fully open; that is, at 45 degrees to the front panel of the management.
6. Holding the management by its sides, carefully set the management module into the chassis.
7. Using only the management ejector handles, slowly slide the module into the chassis until the hooks reach the vertical bar.

> Do not apply excessive force to slide in the management module. If you feel resistance, remove the management and double check both the chassis and management for any damage.

8. Catch the hooks onto the vertical bar of the chassis and push the ejector handle shut.
9. Lock the ejector handles onto the module.

> On switch systems with dual management systems, first connect the cable and configure the master management module and only then configure the slave. By default the master is the top management module. For further information on the master and slave roles, see section "Subnet Manager (SM) High Availability (HA)" of the MLNX-OS® User Manual.

> All management modules in the chassis must go through an initial configuration procedure. See the Installation Guide for the initial configuration procedure.

2.9.6 Switch Shut-Down Procedures

The chassis cannot be shut down using remotely. To shut it down, the power plugs need to be physically pulled from the power grid.

To reboot any of the modules accessible through CLI, the command "reload" must be run on them in configuration mode "Config" as shown in the following:

```
switch (config)# reload
```

3 Interfaces

3.1 LED Status Indicators

The LEDs are placed on the chassis for the convenience of the IT manager. All chassis conditions and management options are available and controllable through the management software, either CLI or WebUI.

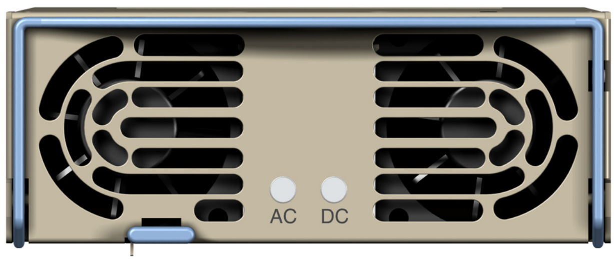
> It is recommended that all of the chassis subsystems be maintained and managed through the management software.

3.1.1 Power Supply Unit LEDs

The PSUs are on the spine side of the chassis at its upper side and are behind two cover panels. The plugs for these PSUs are on the leaf side of the chassis.

Each power supply unit has the following LED indicators.

Figure 52: Power Supply Unit Status Indications



- AC OK – LED indicator
  - Green – when input voltage is $85V_{AC} < V_{in} < 270V_{AC}$
  - Red – when input voltage is $85V_{AC} > V_{in}$ or $V_{in} > 270V_{AC}$
- DC OK – LED indicator
  - Green – when output voltage above 90%+/- 5% of $48V_{DC}$
  - Red – when output voltage fallen below 90%+/- 5% of $48V_{DC}$

Figure 53: CS7500 PSU Cover

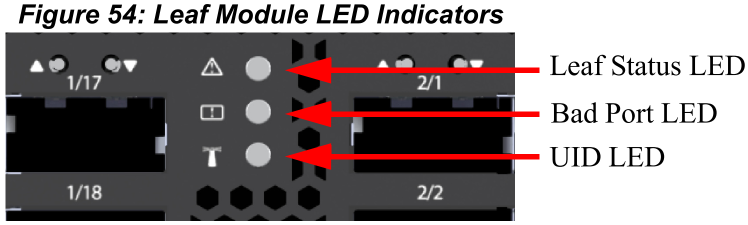


3.1.2 System AC Power Interface

Each PSU in the switch system has a dedicated AC inlet. The inlets are numbered, 1 through 10, corresponding to the numbers on the PSU covers. The system utilizes C19/C20 AC inlet standard where C20 socket is installed on the system. A C19-to-C20 power cord is provided with the system. An appropriate capacitor discharge unit (CDU) should be installed to interface with the system.

3.1.3 Leaf Module LED Indicators

Figure 54: Leaf Module LED Indicators



3.1.3.1 Status LED

The Status LED is located in the middle of the leaf to allow easier visibility when all cables are installed.

The leaf Status indicator LED has the following LED assignment:

Table 7 - Leaf Status LED

LED Condition	Description
Off	No power to the leaf
Green: Solid	Leaf is up and running
Green: Flashing	Leaf is booting or being restored to factory default
Amber: Solid	Fatal error

3.1.3.2 Bad Port LED !

The Bad Port LED is located on the left side of the leaf. The following Bad Port LED conditions are possible.

Table 8 - Bad Port LED Configurations

LED Condition	Description
Off	OK: All ports are up and running
Amber: Flashing	Error: One or possibly more ports has just received a symbol error

This LED shows symbol errors. Possible causes for this are:

- bad cable
- bad connection
- bad connector

This LED lights up when one or more ports is receiving a symbol error. The LED immediately goes off until the next symbol error is received.

3.1.3.3 UID LED Switch Identifier

The UID LED is a debug feature that will become available to customers in the near future. For details please contact Mellanox Technologies support.

3.1.3.4 Leaf Module Port Connector LED Assignment

Above the ports are two LEDs one for the upper port ▲ and one for the lower port ▼. Each port has a single 2 color LED. Table 9 presents the link status according to the LED condition.

Table 9 - Connector Physical and Logical Link Indications

LED Condition	Description
Off	No power to the port
Green: Solid	Logical link up
Green: Flashing	Data activity: Flashing frequency is proportional to data transfer speed

Table 9 - Connector Physical and Logical Link Indications

LED Condition	Description
Amber: Solid	Physical link up
Amber: Flashing	A problem with the physical link

The LED indicator, corresponding to each data port, will light orange when the physical connection is established (that is, when the unit is powered on and a cable is plugged into the port with the other end of the connector plugged into a functioning port). When a logical connection is made the LED will change to green. When data is being transferred the light will blink green.

> The switch does not provide a visual means to indicate the port speed configuration (SDR, DDR, QDR, FDR, or EDR) and/or the link width (1X or 4X). The speed and link width configurations can be retrieved using management software.

3.1.4 Spine Module LED Indicators

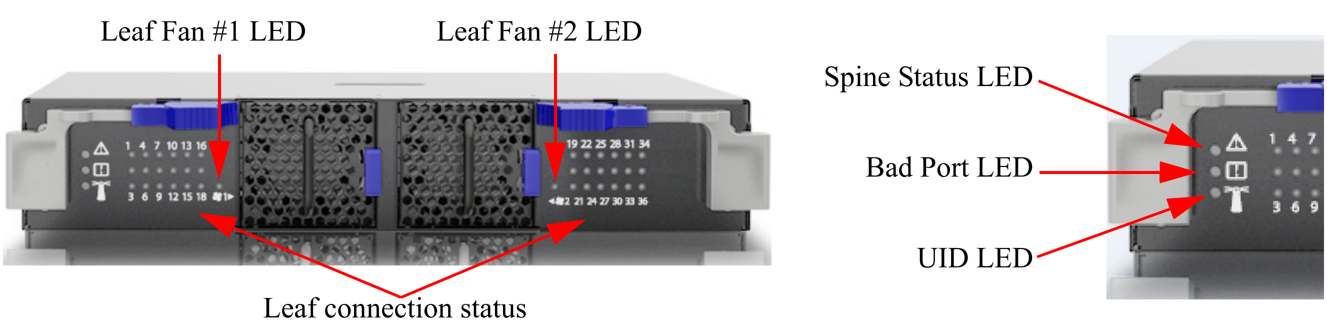
Each leaf module is connected by links to each spine module. Each spine has the following LEDs.

- One status LED for the spine health
- Two status LED for the spine fan modules, one per module
- 36 status LEDs showing the existence of leaf to spine connections
- One Bad Port LED showing symbol errors in the data stream
- One UID LED that can be lit to identify an individual spine

The 36 LEDs on each spine are divided by the number of leafs and the result (N) is the number of connections from each leaf that are connected to the spine. 18 spines must be installed and working to ensure that full BW exists between nodes. The maximum number of connections from each leaf is 1. If the (number of leafs) x (the maximum number of connections per leaf) is less than 36 then some of the leaf to spine connection LEDs may be OFF.

The status LEDs for the spine and their descriptions are shown in Table 10. The LEDs indicate as follows.

Figure 55: Spine Status LEDs



3.1.4.1 Status LED

Table 10 shows the spine status according to the LED condition.

Table 10 - Spine Status LED

LED Condition	Description
Off	No power to the spine
Green: Solid	Spine is up and running
Green: Flashing	Spine is powering up or being restored to factory default
Amber: Solid	Fatal error

3.1.4.2 Fan LED

For each fan drawer in the spine there is a status LED. The spine fan indicator LED has the following LED assignment.

Table 11 - Spine Fan Status LED

LED Color	Description
Green: Solid	Spine fan is OK
Amber: Solid	One of the fans is not working and needs replacement

3.1.4.3 Spine to Leaf IB Connection Status LEDs

The leaf connection status on each spine displays the condition of the connection between the spine and each leaf. There is a minimum of one LED per leaf per spine and a maximum of 1 LED per leaf. These LEDs indicate a valid connection between a leaf and a spine.

Table 12 shows the leaf to spine status according to the LED condition.

Table 12 - Spine to Leaf IB Link Status

LED Color	Description
Off	Link is down
Green: Solid	Logical connection
Green: Flashing	Data activity
Amber: Solid	Physical connection established

3.1.4.4 Bad Port LED

The Bad Port LED is located on the left side of the spine. The following Bad Port LED conditions are possible:

Table 13 - Bad Port LED Configurations

LED Condition	Description
Off	OK: No ports have received symbol errors recently
Amber: Flashing	Error: One or possibly more ports has just received a symbol error

This LED shows symbol errors. Possible causes for this are:

- bad cable
- bad connection
- bad connector

This LED lights up when one or more ports is receiving a symbol error. The LED immediately goes off until the next symbol error is received.

3.1.4.5 UID LED Switch Identifier

The UID LED is a debug feature that will become available to customers in the near future. For details please contact Mellanox Technologies support.

3.1.5 Spine Side Panel Display LED Indicators

The spine side panel display has LEDs that show the chassis condition.

Figure 56: Spine Side Panel Display Status Indications

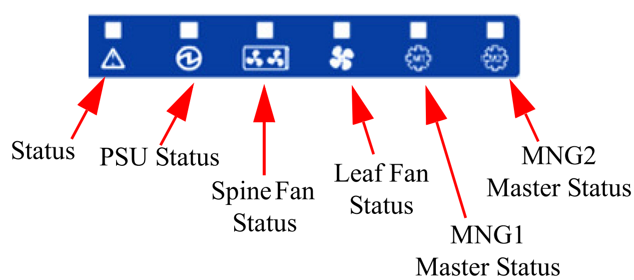


Table 14 - Spine-Side Panel LED Display for Normal Operation

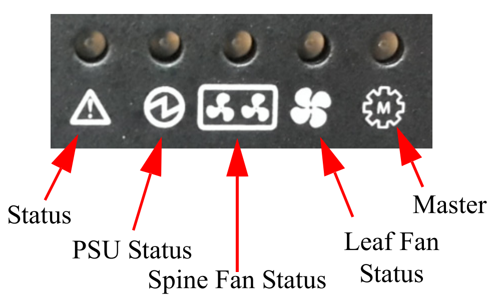
LED	Condition	Description	Normal State
Status	Off	No power	Green
	Green	System is up and running	
	Green: Flashing	System booting/restore factory default in progress	
	Amber	Fatal error	

Table 14 - Spine-Side Panel LED Display for Normal Operation

LED	Condition	Description	Normal State
PSU Status	Off	No power	Green
	Green	Normal operational	
	Amber	PS fault detected – check individual power supplies for fault indications	
Spine Fan Status	Off	No power	Green
	Green	Normal operation	
	Amber	Fatal error in one or more of the spine fans – check individual spine fan LEDs for fault indications	
Leaf Fan Status	Off	No power	Green
	Green	Normal operation	
	Amber	Fatal error in one or more of the leaf fans – check individual leaf fan LEDs for fault indications	
MNG1 Master Status	Off	• No power • Management module is not installed • Management module is not the master	Green
	Green	Management module is up and operating as master	
	Amber	Slave management module not installed	
MNG2 Master Status	Off	• Management module is not the master • No power	Off
	Green	Management module is up and operating as master	

3.1.6 Management Module LED Indicators

Figure 57: Management Module Indications



The management module LEDs display the switch system operating conditions.

Table 15 - Management LED Display for Normal Operation

LED	Condition	Description	Normal State
Status LED: Shows the status of the chassis.	Off	No power	Green
	Green	System is up and running	
	Green: Flashing	System booting/restore factory default in progress	
	Amber	System error – attention needed (e.g. overheating, diagnostics fail, CPU hang, HW fail, overheat-critical)	
PSU Status	Off	No power	Green
	Green	Normal operation	
	Amber	PS fault detected – check individual power supplies for fault indications	
Spine Fan Status	Off	No power	Green
	Green	Normal operation	
	Amber	Fatal error in one or more of the spine fans – check individual spine fan LEDs for fault indications	
Leaf Fan Status	Off	No power	Green
	Green	Normal operation	
	Amber	Fatal error in one or more of the leaf fans – check individual leaf fan LEDs for fault indications	
Master	Off	This management module is not the master	Green
	Green	Management module is operating as a master	

3.1.7 Port Connector Interfaces

The connector side of the switch has 18 leaf modules and each leaf module has 36 QSFP28 ports. The ports on each leaf module are placed in two rows, 18 ports to a row. The ports are labeled as shown in Figure 58. The bottom row ports are flipped from the top row. See Figure 59.

Figure 58: Port Numbering

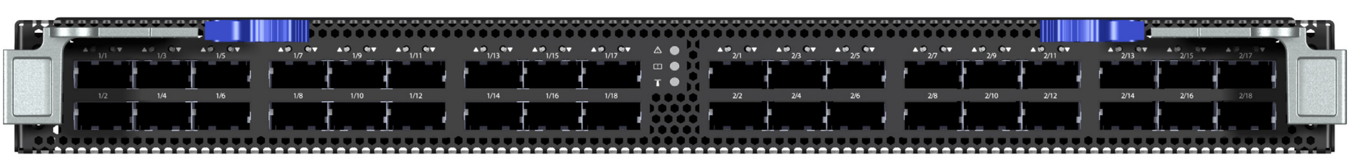
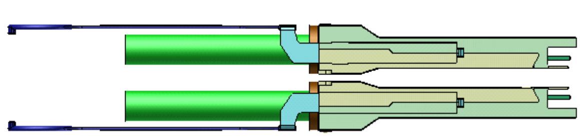


Figure 59: Top and Bottom Ports



3.2 Air Flow

These switches come with the air flow pattern of air entering through the spine side and exiting through the connector side.

3.3 QSFP Cable Power Budget Classification

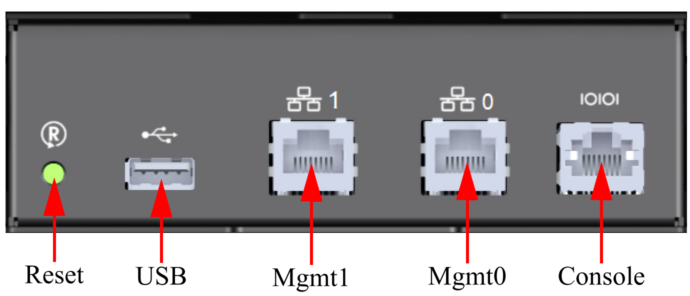
All CS7500 switch systems are designed for active cables with a max power per module of 3.5W. This is power level 4 according to the QSFP Public Specification.

3.4 Management Module Interfaces

The switch system requires at least one management module. The management module has 6 interfaces to connect to the CS7500. They are:

- 1 I^2C/CONSOLE port – this is an I^2C/RS232 connector for connecting to a host machine
- 2 MGMT – this is an Ethernet connector
- 1 USB port
- 1 RST – reset button
- 1 QSFP port – for debug purposes only

Figure 60: Management Module Interfaces



3.4.1 I^2C/Console (RS232)

The console port is used during the installation process to configure the chassis for remote management. Connect this port to a local host using the harness supplied with the chassis. See the MLNX-OS® User Manual for the initial configuration procedure. RS232 connection should be configured for 119Kb baud-rate.

> Other than initial configuration, this interface is for debug and troubleshooting only. Only FAEs are authorized to connect through it.

3.4.2 Management

The management ports are 1Gb/s Ethernet (1GbE) ports for remote management. Any remote terminal connected to the Ethernet port can then be used to manage the fabric and chassis.

Initial configuration must be done on all of the management modules. The first management module you configure will be the master.

3.4.3 USB

The USB 2.0 port can be used to upload new software using any storage device that has a USB connector.

3.4.4 Reset – RST

The Reset button resets the chassis management module when the button is pushed. When the button is held down for 15 seconds the management module is reset and the password deleted.

Do not use a sharp pointed object such as needle or push pin for pressing the Reset button. Sharp objects can cause damage, use a flat object such as a paper clip.

This button resets the CPU of the management module. A quick push of this button performs this reset. When the reset button is pushed on the master management module this management module is reset becoming the slave and the other management module becomes the master. If there is only one management module in the chassis all of the leafs and ports are reset by bringing them down and powering them up when the reset button is pushed. When the button is held down for 15 seconds the management module is reset and the password is deleted. You will then be able to enter without a password and make a new password for the user “admin”.

4 Chassis Power Up

> Before starting any procedure on the CS7500 system put an ESD prevention wrist strap on your wrist and connect to the chassis.

With N+N PSU redundancy the chassis must be started with a full complement of possible PSUs, thereafter it can run on half of the total number of PSUs. Connecting the PSUs to different AC lines provides AC failover protection.

The system should continue to run and allow a hot swap of a defective PSU. Should there not be enough power to keep all of the leafs running, MLNX-OS® may power down some leafs. If this happens it will be necessary to reboot the chassis once the defective PSU has been replaced.

1. Check all FRUs for proper insertion and seating before connecting the AC power cords.
   - Power supplies
   - Leaf fan modules
   - Spine modules
   - Spine fan modules
2. Insert all leafs that you plan to use in the chassis.
3. Insert thermal blanks in unused leaf and management slots to maintain balanced air flow.
4. Connect the power cords to the PSUs.
5. Connect the power cords to grounded electrical outlets.

> A fully loaded CS7500 series switch system can draw 12.5kW of power. Make sure that the outlets and circuits will not be overloaded. Spread out the load over at least two or three circuits, or a 3 phase supply.

4.1 System Status After Power Up

> It can take around 5 minutes for the system to boot up. Turn off the system if any LEDs remain red for more than 7 minutes.

As system boot been completed you should observe the following:

1. PSU AC OK and DC OK indicators are green.
2. That the Status LED on each spine, leaf, and management module are *green* which indicates that the power supplies are good.
3. Spine module indicators display the status of internal links to the installed leaf modules. All PHY links to existing leafs should be ON.
4. Check the spine LEDs and make sure they coincide with Figure 61.

Figure 61: Spine Side Panel Display Status Indications



5. Check the Management Module LEDs and make sure they coincide with Figure 62.

Figure 62: Management Module Status Indications for Normal Operation (Master)

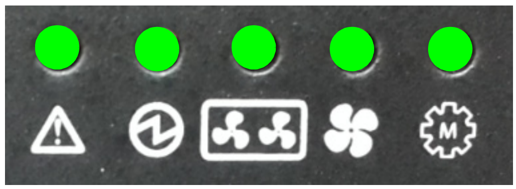
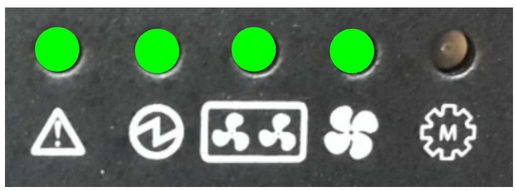


Figure 63: Management Module Status Indications for Normal Operation (Slave)



5 Switch Management Tools

This chapter describes the management module and tools available for Out-of-Band management of the switch system via MLNX-OS®.

> There are 4 1Gb/s Ethernet ports (2 for each management module) that get connected to Ethernet switches which must be configured to 10/100M auto-negotiation.

The CS7500 switch is pre-installed with MLNX-OS® management software. MLNX-OS is installed on all Switch-IB™ based managed switch systems. MLNX-OS includes a CLI, WebUI, SNMP, and XML interfaces which facilitate configuring chassis management features, and InfiniBand management software (OpenSM).

For more information, please refer to the MLNX-OS User Manual.

The managed switch system includes the following software components:

- Embedded Subnet Manager (SM)
- Chassis manager and system BIST
- SNMP agent, 3rd party tool integration
- GUI
- Remote logging
- SSH/telnet
- Secured access in-band and out-band
- IPv4/IPv6 network stack

The chassis manager will give the user access to:

- Switch temperatures
- Power supply voltages
- Fan unit information
- Power unit information
- Flash memory
- Monitoring of:
  - AC power to the PSUs
  - DC power out from the PSUs
  - chassis failures
- querying for:
  - switch serial numbers
  - revisions
  - software version
  - Switch-IB™ FW version
  - switch temperatures

The manager also has the ability to burn new firmware and upgrade software on the switch.

5.1 InfiniBand Subnet Manager

The InfiniBand Subnet Manager (SM) is a centralized entity running in the switch. It discovers and configures all the InfiniBand fabric devices to enable traffic flow between those devices. The SM applies network traffic related configurations such as QoS, routing, partitioning to the fabric devices.

Each InfiniBand subnet needs one SM to discover, activate and manage the subnet. The network requires an SM to be running in either the InfiniBand switch itself (switch based) or on one of the nodes which is connected to the InfiniBand fabric (host based). To learn about SM configuration, please refer to the MLNX-OS® User Manual.

5.2 Fabric Inspector (Diagnostics)

Fabric Inspector is a plug & play software for fee within MLNX-OS® displaying and filtering all identified systems and nodes within the fabric.

Fabric Inspector includes a complete set of tools for fabric wide diagnostics to check node-node and node-switch connectivity and to verify routes within the fabric.

Advanced filtering allows creating filtering rules on a system wide basis, between nodes or port connections based on traffic patterns and user assigned system names (GUIDs).

For more information please refer to the MLNX-OS® User Manual.

5.3 Accessing the CPU via the Ethernet Connector

Once the initial configuration is completed the management tools can be accessed through:

- SSH
- Telnet
- WEB
- SNMP
- XML

5.4 Upgrading Software

The new software updates are available to the user from the Mellanox Support website. Copy the update to a known location on a remote server within your LAN and follow the steps listed in MLNX-OS® User Manual to perform the software upgrade.

> If MLNX-OS® is updated and the FW image in the leafs and spines of the chassis is an earlier version from the minimum requirement, then the chassis management system may require up to ~30 minutes to update all of the FW images in all of the leafs and spines.

6 Troubleshooting

6.1 Power Supply Unit

If the Power supplies cannot supply enough power, the management module may shut down the some leafs.

As each PSU is plugged in, make sure that the green power LEDs on the PSU comes on.

Issue 1. If the AC power LED is off

1. Check that the power cable is the correct power cable for your country.
2. Check that the power cable is plugged into a working outlet.
3. Check that the power cable has a voltage within the range of 180-240 volts AC.
4. Remove and reinstall the power cable.
5. Check the circuit breakers to be sure that the breaker has not tripped.
6. Check that the power cable is good. Replace the power cable.
7. If the AC power LED is green but the DC power LED red, replace the PSU.

6.2 Leaf Module

Issue 1. The power LED for the leaf module is off

1. Make sure that all of the PSUs are showing DC OK.
2. Uninstall and reinstall the Leaf module.
3. When the amber LED is on, this indicates a fault in the module, uninstall and reinstall the leaf module.
4. If uninstalling and reinstalling the leaf module does not work, burn the latest FW on the leaf module and uninstall and reinstall the leaf module.
5. Replace the leaf module with a new one.

Should any of the modules shut down due to over temperature, wait 5 minutes and then follow the procedure starting with Step 2.

Issue 2. The physical link LED for the InfiniBand connector does not come on

1. Check that both ends of the cable are connected.
2. Check that the locks on the ends are secured.
3. Make sure that the latest FW version is installed on both the HCA card and the switch.
4. If media adapters are used check that the all connections are good, tight, and secure.
5. Replace the cable.

Issue 3. The activity indication does not come on

Check that the Subnet Manager has been started.

6.3 Management Module

Issue 1. Amber Status LED for the chassis on the management module is lit

1. Check the MLNX-OS management for confirmation and possible explanation of the alert.
2. Reset the master management module by pushing the rest button. If you have two management modules installed this will convert the master management module to the slave and convert the slave to the master.

> If there is only one management module in the chassis all of the leafs and ports are reset by bringing them down and powering them up when the management module is removed.

3. Make sure the S.Fans and L.Fans LEDs are green.
4. Make sure that the spine and the leafs both have the same version of FW.
5. Reburn the FW and remove and reinstall the management module.
6. If you are running the chassis with only one management module, remove and reinstall the management module. Make sure the mating connectors of the unit are free of any dirt and/or obstacles. See Section 2.9.5 on page 56.
7. If you are running the chassis with only one management module, replace the management module.

Issue 2. Amber LED for the leaf fan on the management module is lit

1. Check the MLNX-OS management for confirmation and possible explanation of the alert.
2. Make sure that there is nothing blocking the front or rear of the chassis and that the fan modules and ventilation holes are not blocked (especially dust over the holes).
3. If you find dust blocking the holes it is recommended to clean the fan unit and remove the dust from the front and rear panels of the switch using a vacuum cleaner.
4. Determine which fan module is problematic by checking the status LED on each fan module.
5. Remove and reinstall the problematic fan unit. Make sure the mating connector of the new unit is free of any dirt and/or obstacles. See Section 2.9.4 on page 53.
6. Replace the Leaf fan module.

> Replace defective leaf fan modules as soon as they are identified.

> Should any of the modules shut down due to over temperature, follow the procedure starting in Step 2

Issue 3. Amber LED for the spine fan on the management module is lit

1. Check the MLNX-OS management for confirmation and possible explanation of the alert.
2. Determine which spine has a defective fan by checking the Fan LEDs on all of the spines.
3. Make sure that there is nothing blocking the front or rear of the chassis and that the fan modules and ventilation holes are not blocked (especially dust over the holes).

4. If you find dust blocking the holes it is recommended to clean the fan unit and remove the dust from the front and rear panels of the switch using a vacuum cleaner.
5. Remove and reinstall the fan unit of the spine. Make sure the mating connector of the new unit is free of any dirt and/or obstacles. See Section 2.9.4 on page 53.
6. Replace the spine fan module.

> Replace defective spine fan modules as soon as they are identified.

6.4 Spine Module

Issue 1. Amber LED on the spine module is lit

1. Check the MLNX-OS management for confirmation and possible explanation of the alert.
2. Make sure that there is nothing blocking the front or rear of the chassis and that the fan modules and ventilation holes are not blocked (especially dust over the holes).
3. If you find dust blocking the holes it is recommended to clean the fan unit and remove the dust from the front and rear panels of the switch using a vacuum cleaner.
4. Remove and reinstall the spine module. Make sure the mating connectors of the unit is free of any dirt and/or obstacles. See Section 2.9.3 on page 50.
5. Make sure that the spine and the Leafs both have the same version of FW.
6. Reinstall the FW and remove and reinstall the spine.
7. Replace the spine module.

6.5 MLNX-OS® Software

Issue 1. The last software update did not succeed:

1. Connect the RS232 (console) connector to a laptop.
2. Push the reset button on the switch or management module.
3. You will have ~ 5 seconds to stop the U-Boot by pressing Control-B.
4. Choose the image to upload. Only use image 1 or image 2.

```
U-Boot 2009.01-mlnx1.4 (May 12 2010 - 14:08:15)

CPU:   AMCC PowerPC 460EX Rev. A at 1000 MHz (PLB=200, OPB=100, EBC=100 MHz)
       Security/Kasumi support
       Bootstrap Option H - Boot ROM Location I2C (Addr 0x52)
       Internal PCI arbiter disabled
       32 kB I-Cache 32 kB D-Cache
Board: Mellanox PPC460EX Board
FDEF:  No
I2C:   ready
DRAM:   2 GB (ECC enabled, 400 MHz, CL3)
FLASH: 16 MB
NAND:  1024 MiB
PCI:   Bus Dev VenId DevId Class Int
PCIE0: link is not up.
```

```
PCIE1: successfully set as root-complex
        01  00  15b3  bd34  0c06  00
Net:   ppc_4xx_eth0, ppc_4xx_eth1
Hit Ctrl+B to stop autoboot:  0

Mellanox FabricIT

Boot Menu:
  1. EFM_PPC_M460EX EFM_1.1.1000 2010-06-24 16:32:03 ppc
  2. EFM_PPC_M460EX EFM_1.1.1200  2010-06-25  18 :00:03 ppc
  3. U-Boot prompt
  Choice:
```

5. Select the image to boot.

For more detailed instructions concerning MLNX-OS® software see the Mellanox MLNX-OS® Switch-IB™ Software WebUI User's Manual or the Mellanox MLNX-OS® Switch-IB™ Software User Manual.

Appendix A: Specification Data

Table 16 - Switch Specification CS7500

Physical	
Size	49" x 19" x 30" inches 1243.8 mm x 482.6 mm x 761.2 mm The shelf adds 44.45 mm to the height
Mounting	19” Rack mount
# of spines	18
# of leafs	18
Weight	214.6 kg (473.1 lb.) empty configuration (no leafs, spines, or management modules) 369.5 kg (814.6 lb.) full configuration 256.2 kg (564.9 lb.) shipped configuration
Accessory Weight	Rail kit: 11.5 kg (25.4 lb.) Cable supporter (18 shelves): 10 kg (22.0 lb.) Cable management: 5 kg (11.0 lb.)
Center of Gravity*	CoGh: 595.9 mm (from bottom of chassis) CoGw: 241.3 mm (from left side surface) CoGd: 359.19 mm (from port-end surface) *Measured from the bottom left corner as one faces the switch system
Total Max. Airflow	56.6 M^3/min (2000 CFM)
SerDes Speeds	10Gb/s, 20Gb/s, 40Gb/s, 56Gb/s, 100Gb/s per port
Connector Types	QSFP28
Power and Environmental	
Input Voltage	180-240 VAC 50-60 Hz
Total Power Consumption EDR	Typical — Passive: 10264W Optical: 13159W (includes QSFP at 3.5W) Maximum — Passive: 10635W Optical: 13531W (includes QSFP at 3.5W)
Max Heat Output	46,170 BTUs/hr
Temperature	Operating: 0° to 40°C Non-operating: -40° to 70°C
Humidity	Operating: 10%-85% non-condensing

Table 16 - Switch Specification CS7500

Physical	
Protocol Support	
Speed Protocol	InfiniBand: Auto-negotiation of 100Gb/s, 56Gb/s,40Gb/s, 20Gb/s, and 10Gb/s
Management	MLNX-OS and baseboard, performance, and device management agents for full InfiniBand in-band management.
Data Rate	Data Rate: 100Gb/s per port
QoS	8 InfiniBand virtual lanes for all ports
Regulatory Compliance	
Safety	US/Canada: cTUVus certificate International: CB report and certificate Europe: CE report & DoC Russia/Belarus/Kazakhstan: CU certificate Argentina: S-mark certificate Korea: KC safety (for the power supply only) Taiwan: BSMI Registration certificate (for the power supply only)
EMC (Emissions)	Europe: CE EMC report & DoC USA: FCC part 15 class A Canada: ICES-003 class A Australia / New Zealand: AS/NZS CISPR 22 class A & RCM SDoC Japan: VCCI, Class A Korea: KC certificate Taiwan: BSMI DoC certificate China: CQC certificate (for the power supply only)
Acoustic	ISO 7779 ETS 300 753
Scalability and Performance	
Switching Performance/ Capacity	Switching capacity: 130 Tb/s
	Switching performance: Simultaneous wire-speed any port to any port
	Addressing: 48K unicast addresses max. per subnet and 15.5K multicast addresses per subnet
	Leafs: Up to 18 leafs; 18-ports each
	Spines: Up to 18 spine boards. All spines are needed for full bi-sectional configuration.
	Management modules: 2 available, 1 required for operation
	Management CPU: x86
	Power supplies: 10 power supplies standard
	Leaf and management module fans: 20
	Spine fans: 36

A.1 EMI Certification

EMI testing on a fully populated chassis has been performed with the chassis installed in a closed two-door rack using the chassis installation kit supplied by Mellanox Technologies.

A.2 Approved Cables

For a list of all approved cables please refer to:
http://www.mellanox.com/page/cables?mtag=cable_overview

A.3 EMC Certifications

The list of EMC certifications per chassis model type, for different markets in the world, is located on the Mellanox Website at:

http://www.mellanox.com/page/environmental_compliance > Boards/Systems > Boards/Systems Certification Matrix

Appendix B: Thermal Threshold Definitions

There are three thermal threshold definitions for the Switch-IB™ switch device which impact the overall switch system operation state: Warning, Critical and Emergency.

1. Warning – 100ºC

   On managed systems only: When the Switch-IB™ device crosses the 100°C threshold, a Warning Threshold message will be issued by the MLNX-OS® management SW, indicating to system administration that the switch has crossed the Warning threshold.

   Note that this temperature threshold does not require nor lead to any action by hardware (such as switch shutdown).

2. Critical – 120ºC

   When the Switch-IB™ device crosses this temperature, the firmware will automatically shut down the device.

3. Emergency – 130ºC

   In case the firmware fails to shut down the Switch-IB™ device upon crossing the Critical threshold, the Switch-IB™ device will auto-shutdown upon crossing the Emergency (130ºC) threshold.

Appendix C: Calculating the Weight of a Customized Chassis

The weight of a customized chassis can be calculated for any possible customization as follows. Sum up the following weights:

- Spines
- Leafs
- Leaf blanks
- Management modules
- Management blanks

Chassis weight already includes pre-installed 20 fan FRUs and 10 PS units.

Rail kit, cable supporters, and cable management kits' weight is not included and may be added separately if needed.

Fill in the Table 17 to calculate the weight of your system.

Table 17 - Switch System Weight Calculation

Number of FRUs	FRU Type	Weight of 1 FRU	Total Weight / FRU Type
	Chassis as shipped	214.6	
	# of Spines *	3.015	=
	# of leafs *	5.045	=
	# of leaf blanks *	1.303	=
	# of management modules *	4.877	=
	# of management module blanks *	1.473	=
	Total		=

This total is in kilograms. Multiply the total by 2.2 to get the total weight in pounds.

Appendix D: Calculating the Power of a Chassis

To calculate the power consumption of a chassis add the power of the fans, spines, leafs, and management modules.

Table 18 - Power Consumption of Chassis Parts

Part	Typical (W)	Maximum (W)
IB EDR leaf with passive cables	322	335
IB EDR leaf with 36 optical cables	483	496
Spine	163	170
Chassis fans	740	740
Management module	250	250

Table 18 assumes the QSFP cable power consumption specified in Table 19. Please note that QSFP module power is related to the module itself and is not referenced to AC plane.

Table 19 - QSFP Cable Power Consumption

QSFP Cable Type	Typical (W)	Maximum (W)
Optical	3.5	3.5

To calculate the total power consumption of the switch system at a certain configuration, fill out Table 20 in the following manner:

1. In the Power column fill in the desired typical or maximum values.
2. In the Quantity column, fill in the desired configuration.
   Please note that the number of fans is not configurable and is always 1.
3. Get the total power per each FRU by multiplying values in adjusted columns in the same row.
4. Get the total switch system power consumption system power by summing up all multiplication products.

Table 20 - Calculating Total Switch System Power Consumption

Part	Quantity	Power	Quantity x Power
IB EDR leaf with passive cables			
IB EDR leaf with optical cables			
Spine			
Chassis fans	1		
Management module			
Total power			

Appendix E: QSFP Interface

Table 21 - InfiniBand QSFP Connector Pin-out

Connector Pin Number	Connector Pin Name	Signal Description
1	GND	Ground
2	Tx2n	Transmitter Inverted Data Input
3	Tx2p	Transmitter Non-Inverted Data Input
4	GND	Ground
5	Tx4n	Transmitter Inverted Data Input
6	Tx4p	Transmitter Non-Inverted Data Input
7	GND	Ground
8	ModSelL	Module Select
9	ResetL	Module Reset
10	Vcc Rx	+3.3 V Power supply receiver
11	SCL	2-wire serial interface clock
12	SDA	2-wire serial interface data
13	GND	Ground
14	Rx3p	Receiver Non-Inverted Data Output
15	Rx3n	Receiver Inverted Data Output
16	GND	Ground
17	Rx1p	Receiver Non-Inverted Data Output
18	Rx1n	Receiver Inverted Data Output
19	GND	Ground
20	GND	Ground
21	Rx2n	Receiver Inverted Data Output 3
22	Rx2p	Receiver Non-Inverted Data Output 3
23	GND	Ground
24	Rx4n	Receiver Inverted Data Output 3
25	Rx4p	Receiver Non-Inverted Data Output 3
26	GND	Ground
27	ModPrsL	Module Present

Table 21 - InfiniBand QSFP Connector Pin-out

Connector Pin Number	Connector Pin Name	Signal Description
28	IntL	Interrupt
29	Vcc Tx	+3.3 V Power supply transmitter
30	Vcc 1	+3.3 V Power Supply
31	LPMode	Low Power Mode
32	GND	Ground
33	Tx3p	Transmitter Non-Inverted Data Input
34	Tx3n	Transmitter Inverted Data Input
35	GND	Ground
36	Tx1p	Transmitter Non-Inverted Data Input
37	Tx1n	Transmitter Inverted Data Input
38	GND	Ground

Figure 64: InfiniBand QSFP Connector Symbol

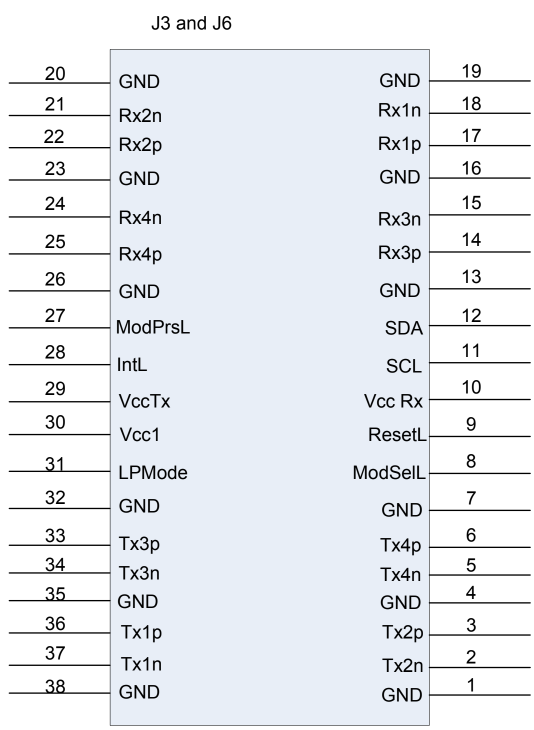
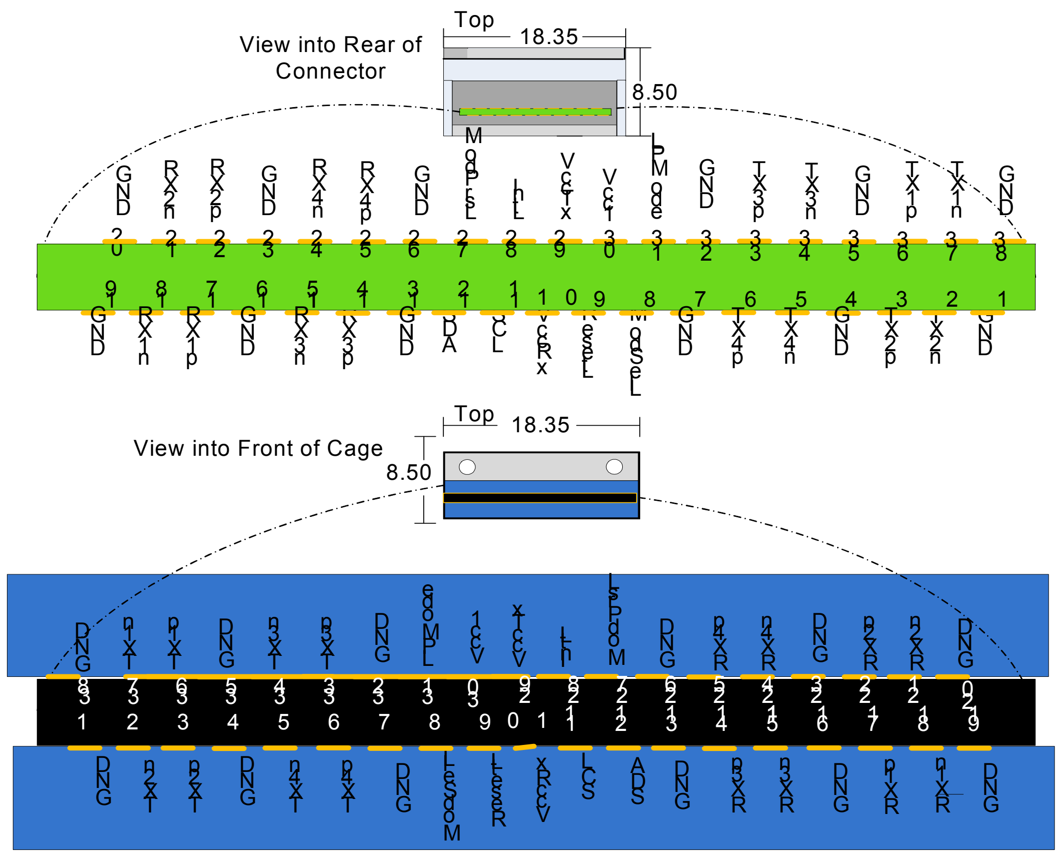


Figure 65: QSFP Connector Male and Female Views



Appendix F: Replacement Parts Ordering Numbers

Table 22 - Replacement Parts Ordering Numbers

Part Description	OPN
2.5KW AC Power Supply w/ P2C air flow	MTDF-PS-A
Switch-IB™ EDR InfiniBand leaf blade, 36 QSFP28 ports, RoHS R6	MSB7510-E
MCS75xx director system, Leaf – Blank	MTDF-BLK-C
Switch-IB™ EDR InfiniBand spine blade, 36 ports, RoHS R6	MSB7520-E
MCS75xx director system, Spine – Blank	MTDF-BLK-A
x86 dual-core chassis management module, RoHS R6	MMB7500
MCS75xx director system, Management – Blank	MTDF-BLK-B
MCS75xx 648-port director system rail kit	MTDF-KIT-A
MCS75xx 216 and 324-port director system rail kit	MTFD-KIT-B
MCS75xx director system cable holder	MTDF-CH-A
MCS75xx director system cable supporter	MTDF-CP-A
Director system fan unit located on the spine side	MTDF-FAN-A
Director system fan unit located on the spine fan unit	MTDF-FAN-B
DB9 to RJ45 Harness	HAR000028
Power cord black 250V 16A 2000MM C19 to C20 VDE	ACC000734

Appendix G: Safety Warnings (Multiple Languages)

G.1 Nordic Countries Notices

Finland: “Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan”
Norway: “Apparatet må tilkoples jordet stikkontakt”
Sweden: “Apparaten skall anslutas till jordat uttag”

G.2 Installation Safety Warnings (English)

1. Installation Instructions

Read all installation instructions before connecting the equipment to the power source.

2. Bodily Injury Due to Weight

Use enough people to safely lift this product.

3. Heavy Equipment

This equipment is heavy and should be moved using a mechanical lift to avoid injuries.

4. Risk of Electric Shock!

Risk of Electric Shock!
With the fan module removed power pins are accessible within the module cavity.
DO NOT insert tools or body parts into the fan module cavity.

5. Over-temperature

This equipment should not be operated in an area with an ambient temperature exceeding the maximum recommended: 45°C (113°F). Moreover, to guarantee proper , allow at least 8cm (3 inches) of clearance around the ventilation openings.

6. Stacking the Chassis

The chassis should not be stacked on any other equipment. If the chassis falls, it can cause bodily injury and equipment damage.

7. Redundant Power Supply Connection - Electrical Hazard

This product includes a redundant power or a blank in its place. In case of a blank power supply, do not operate the product with the blank cover removed or not securely fastened.

8. Multiple Power Inlets

Risk of electric shock and energy hazard.

The PSUs are all independent.

Disconnect all power supplies to ensure a powered down state inside of the switch platform.

9. During Lightning - Electrical Hazard

During periods of lightning activity, do not work on the equipment or connect or disconnect cables.

10. Copper InfiniBand Cable Connecting/Disconnecting

Copper InfiniBand cables are heavy and not flexible, as such they should be carefully attached to or detached from the connectors. Refer to the cable manufacturer for special warnings/instructions.

11. Rack Mounting and Servicing

When this product is mounted or serviced in a rack, special precautions must be taken to ensure that the system remains stable. In general you should fill the rack with equipment starting from the bottom to the top.

12. Equipment Installation

This equipment should be installed, replaced, and/or serviced only by trained and qualified personnel.

13. Equipment Disposal

Disposal of this equipment should be in accordance to all national laws and regulations.

14. Local and National Electrical Codes

This equipment should be installed in compliance with local and national electrical codes.

15. UL Listed and CSA Certified Power Supply Cord

For North American power connection, select a power supply cord that is UL Listed and CSA Certified, 3 - conductor, [16 AWG], terminated with a molded plug rated at 125 V, [13 A], with a minimum length of 1.5m [six feet] but no longer than 4.5m.

For European connection, select a power supply cord that is internationally harmonized and marked “<HAR>”, 3 - conductor, minimum 1.0 mm^2 wire, rated at 300 V, with a PVC insulated jacket. The cord must have a molded plug rated at 250 V, 10 A.

16. Installation codes

This device must be installed according to the latest version of the country national electrical codes. For North America, equipment must be installed in accordance to the applicable requirements in the US National Electrical Code and the Canadian Electrical Code.

17. Interconnection Of Units

Cables for connecting to the unit RS232 and Ethernet Interfaces must be UL certified type DP-1 or DP-2. (Note- when residing in non LPS circuit)

18. Overcurrent Protection

A readily accessible Listed branch circuit overcurrent protective device rated 20 A must be incorporated in the building wiring.

19. Do Not Use the Switch as a Shelf or Work Space

Caution: Slide/rail mounted equipment is not to be used as a shelf or a work space. The rails are not intended for sliding the unit away from the rack. It is for permanent installation at final resting place only, not used for service and maintenance

20. WEEE Directive

According to the WEEE Directive 2002/96/EC, all waste electrical and electronic equipment (EEE) should be collected separately and not disposed of with regular household waste.

Dispose of this product and all of its parts in a responsible and environmentally friendly way.

21. Country of Norway Power Restrictions

This unit is intended for connection to a TN power system and an IT power system of Norway only.

G.3 אזהרות בטיחות בהתקנה (עברית)

1. הוראות התקנה

קרא היטב את כל הוראות ההתקנה לפני חיבור המוצר לחשמל.

2. תקן ישראלי

יש להתקין את המוצר תוך הקפדה על תקנות החשמל הנהוגות בישראל, ולעשות שימוש ביחידת חלוקת כוח העומדת בתקן ישראלי (ת"י) 32.

3. חבלת גוף כתוצאה מנשיאת משקל יתר

נדרשת נוכחותם של מספר מתקינים כדי להרים את המוצר בבטחה.

4. ציוד כבד

המוצר כבד ויש לשנעו באמצעות מעלית מכאנית כדי למנוע חבלה.

5. סכנת התחשמלות!

סכנת התחשמלות:

בעת שיחידת המאוורר מפורקת, רכיבי חשמל נחשפים בחלל הריק. אין להחדיר כלים או איברי גוף לחלל המיועד להרכבת היחידה.

6. התחממות יתר

אין להפעיל את המוצר באיזור שבו טמפרטורת החדר עולה על הטמפרטורה המקסימלית המומלצת: 45°C (113°F).

בנוסף, כדי להבטיח כניסת אוויר תקינה, יש לוודא כי קיים שטח פנוי של 8 ס"מ (3 אינץ') לפחות סביב פתחי האיוורור.

7. ערימת המערכת

אין לערום את המערכת על גבי ציוד אחר. במקרה של נפילה, עשויים להגרם נזקי גוף ורכוש.

8. חיבור ספק כוח נוסף- סכנת חשמל

.

המערכת מכילה ספק כוח נוסף לגיבוי או, בחלק מהמקרים, חלל ריק המאפשר הרכבת ספק כזה. אין לעשות שימוש במערכת כשהמכסה החוסם את החלל הריק אינו סגור כהלכה.

9. מספר שקעים חשמליים

סכנת התחשמלות ואזהרת אנרגיה.

כל אחד מספקי הכוח פועל באופן עצמאי. יש לנתק את כל ספקי הכוח כדי להבטיח ניתוק מוחלט של המערכת מזרם חשמלי.

10. בעת סופות ברקים - סכנת חשמל

בעת סופות ברקים, אין להפעיל את המערכת או לחבר/לנתק כבלים.

11. חיבור או ניתוק של כבלי אינפיניבאנד מנחושת

כבלי InfiniBand מנחושת הם כבדים וקשיחים.

לפיכך, יש לחברם ולנתקם מהמחברים בזהירות רבה. לאזהרות נוספות, יש לעיין בעלון לצרכן מטעם יצרן הכבלים.

12. הרכבה על גבי מדף בארון

כאשר מרכיבים מוצר זה על גבי מדף בארון, יש לנקוט באמצעי זהירות מיוחדים בכדי להבטיח שיוותר יציב. ככלל, יש למלא את מדפי הארון החל מהתחתון ועד לעליון.

13. התקנת המוצר

כל התקנה, החלפה או טיפול במוצר זה חייבת להתבצע על ידי איש צוות מיומן ומוסמך בלבד.

14. השלכת פסולת

השלכת המוצר בתום השימוש חייבת להיעשות בהתאם לכל התקנות והחוקים הלאומיים.

15. תקנות חשמל מקומיות ולאומיות

יש להתקין מערכת זו בהתאם לתקנות החשמל המקומיות והלאומיות.

16. כבל אספקת חשמל

על מנת לחבר את המוצר לחשמל בצפון אמריקה, יש לבחור כבל חשמלי מאושר UL ובעל הסמכת CSA, 3 - מוליך, [AWG 16], שבקצהו תקע מובנה 125V 13A, אורכו המינימלי 1.5 מטר (6 אינץ') ואורכו המקסימלי 4.5 מטר.

לחיבור אירופאי, בחר כבל חשמלי בעל התאמה בינלאומית וסימון "<HAR>", 3 - מוליך, גידים פנימיים באורך מינימלי של 1.0 מילימטר^2, V 300, עם עטיפת PVC מבודדת. על הכבל לכלול תקע מובנה V 250, 10A.

17. תקנות התקנה

יש להתקין מערכת זו על פי הגרסה האחרונה של תקנות החשמל הלאומיות הנהוגות במדינה. עבור צפון אמריקה, יש להתקין את המערכת בהתאם לתקנות החשמל הלאומיות המיושמות בארה"ב ובקנדה.

18. חיבור בין מערכות

על כבלים לחיבור היחידה לממשקי RS232 ו-Ethernet להיות בעלי הסמכת UL מסוג DP-1 או DP-2 (כאשר הם מצויים במעגל חשמלי שאינו מקור כוח מוגבל).

19. הגנה מפני מתח גבוה

יש להקפיד על המצאותם בבניין ועל זמינותם של אמצעים להגנה מפני מתח גבוה בתקן 20A.

20. אין להשתמש במערכת כמדף או שטח עבודה

זהירות: אין להשתמש בציוד כמדף או שטח עבודה. המסילות לא נועדו לשליפת המערכת מהארון, אלא להתקנה במיקומו הקבוע והסופי של הארון.

21. תקנת WEEE

על פי תקנות WEEE 2002/96/EC, יש להשליך את כל פסולת הציוד החשמלי והאלקטרוני בנפרד מפסולת ביתית רגילה.

בתום השימוש, השלך לאשפה את המוצר הזה ואת כל חלקיו באופן אחראי וידידותי לסביבה.

22. מגבלות חשמליות בנורבגיה

יחידה זו מיועדת לחיבור למערכת אספקת חשמל מסוג TN ולמערכת אספקת חשמל מסוג IT, בנורבגיה בלבד.

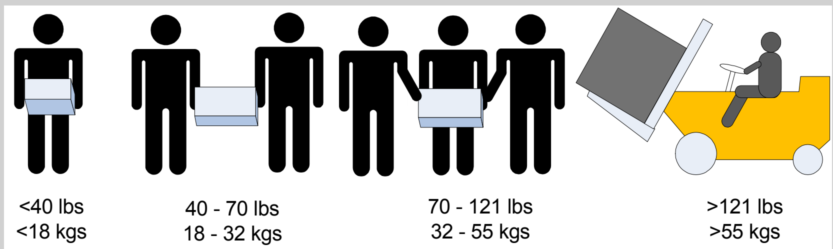
G.4 安裝安全性警告 (Chinese)

1. **安裝指示**

本設備附有備援電源供應器或在適當位置配有空白蓋板。

2. **因重量導致的人身受傷**

為了安全起見，請安排足夠的人員以合力抬起本產品。



3. **重設備**

本設備極重，應使用機械式起重機來搬移，以避免人員受傷。

4. **有觸電的危險**

有觸電的危險！
拆除風扇模組後，即可接觸到模組空腔內的電源針腳。
請勿將工具或機身零件插入到風扇模組空腔內。

5. **溫度過高**

本設備不應在超過所建議的最高環境溫度的區域中運作：45°C (113°F)。此外，為了保證氣流的流通正常，請在通風口旁保留至少 8 公分 (3 英吋) 的間距。

6. **堆疊機箱**

機箱不應堆疊在任何其他設備上。如果機箱掉落，可能造成人員受傷與設備損壞。

7. 複式電源連接時的電擊危險

本設備附有備援電源供應器或在適當位置配有空白蓋板。如果是電源供應器空白蓋板，在空白蓋板已取下或未牢牢固訂的情況下，請勿操作本產品。

8. 多電源輸入座

電擊與能源危害的危險。
所有 PSU 均各自獨立。
將所有電源供應器斷電，確保交換器平台內部在電源關閉狀態。

9. 閃電時的電擊危險

在閃電期間，不要使用本設備或連接或拔下纜線。

10. InfiniBand 銅纜連接 / 拔下

InfiniBand 銅纜很重且沒有彈性，因此必須小心裝在連接器上或自連接器上拔下。如需相關的特殊警告 / 指示，請洽詢纜線製造商。

11. 機架安裝與維修

此產品已安裝在機架中或在機架中維修時，必須採取特定預防措施以確保系統維持穩定。一般您應該將設備從底部到頂端放滿機架。

12. 設備安裝

本設備僅限由經過訓練與 / 或合格的人員安裝、更換或維修。

13. 設備棄置

棄置本設備應遵照所有國內法規。

14. 當地與國家電氣法規

請遵照當地與國家電氣法規安裝本設備。

15. UL 列名和 CSA 認證電源線

北美地區在接上電源時，請選用獲得 UL 列名和 CSA 認證、三個導體、[16 AWG] 附成型插頭，額定值為 125 V、[13 A]，長度至少 1.5 公尺 [六英尺]，但不超過 4.5 公尺的電源線。

歐洲地區在接上電源時，請選用國際協調式且標示有 <HAR> 字樣、三個導體、標稱截面至少 1.0 平方公厘，額定值為 300 V，採用 PVC 絕緣的電源線。電源線需有成型插頭，額定值為 250 V, 10 A。

16. 高漏電流

警告：高漏電流；必須執行地線連接，然後再連接電源供應器。

17. 安裝法規

請務必遵循最新版的國家電氣法規，安裝本設備。在北美地區，請務必遵循美國國家電工法規和加拿大電工法規中的適用規定，安裝本設備。

18. 互連設備

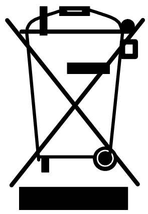
連接至 RS232 設備和乙太網路介面的纜線必須是 UL 認證類型 DP-1 或 DP-2。(請注意位於非 LPS 電路時)

過電流保護：準備好使用的列名分支電路過電流保護裝置最大額定值 20 A 必須整合在配線中。

19. 切換開關不可用作機架或工作空間

小心：滑軌 / 導軌安裝設備不可用作機架或工作空間。導軌不適用於將設備滑出機架使用。僅限永久安裝在最後安置區域時使用，不可用於維修和保養。

20. WEEE 指令



根據 WEEE 指令 2002/96/EC，所有廢棄的電氣與電子設備 (EEE)，應分開集中，而且不應與一般家庭廢棄物一起棄置。
請以負責和環保的方式棄置本產品及其所有零件。

21. 挪威國家電源限制



本設備僅限連接至挪威的 TN 電源系統和 IT 電源系統。

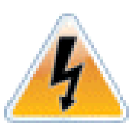
G.5 Avertissements de sécurité pour l'installation (French)

1. Instructions d'installation

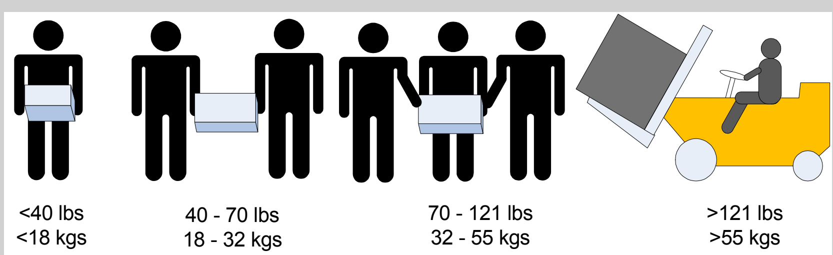


Veuillez lire la totalité des instructions d'installation avant de relier l'équipement au secteur.

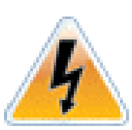
2. Blessures à cause du poids



Prévoyez assez de personnel pour soulever ce produit en toute sécurité.



3. Équipement lourd



Cet équipement est lourd et doit être déplacé avec un système de levage mécanique pour éviter les blessures.

4. Danger d'électrocution

Danger d'électrocution !
Lorsque le module de ventilation est retiré, les broches d'alimentation sont exposées dans l'emplacement du module.
NE PAS insérer d'outils ou la main dans l'emplacement du module.

5. Surchauffe

Cet équipement ne doit pas être en service dans un local dont la température dépasse le maximum recommandé de 45°C (113°F). En outre et pour garantir une circulation d'air correcte, laisser un espace d'au moins 8 cm (3") autour des orifices de ventilation.

6. Châssis empilé sur d'autres équipements

Le châssis ne doit pas être empilé sur d'autres équipements. S'il tombe, il peut endommager l'équipement ou entraîner des blessures.

7. Connexion de l'alimentation redondante : danger d'électrocution

Ce produit est équipé d'une alimentation redondante ou d'un cache si elle est absente. Dans ce dernier cas, ne pas faire fonctionner le produit si le cache est retiré ou mal fixé.

8. Plusieurs prises d'alimentation

Risque et danger d'électrocution.
Les alimentations sont toutes indépendantes.
Pour s'assurer que le commutateur est bien hors tension, débranchez toutes les alimentations.

9. En cas d'orage, danger d'électrocution

Pendant un orage, ne pas travailler sur l'équipement ni brancher ou débrancher des câbles.

10. Connexion et déconnexion du câble InfiniBand en cuivre

Les câbles InfiniBand en cuivre sont lourds et peu flexibles. Par conséquent, il faut procéder avec soin pour les brancher ou les débrancher des connecteurs. Consulter le fabricant du câble pour obtenir des instructions ou des avertissements spécifiques.

11. Montage en rack et maintenance

Lors du montage ou de la maintenance de ce produit dans un rack, il faut faire spécialement attention pour s'assurer que l'ensemble reste stable. En règle générale, le rack doit être rempli en commençant par le bas.

12. Installation de l'équipement

Cet équipement ne doit être installé, remplacé et maintenu que par un personnel formé et qualifié.

13. Mise au rebut de l'équipement

La mise au rebut de cet équipement doit se faire conformément à toutes les lois et réglementations nationales.

14. Codes électriques locaux et nationaux

Cet équipement doit être installé conformément aux codes électriques locaux et nationaux.

15. Codes d'installation

Cet appareil doit être installé conformément à la version la plus récente des codes électrique nationaux. En Amérique du Nord, l'équipement doit être installé en respectant les exigences de l'US National Electrical Code et du Code canadien de l'électricité.

16. Cordon d'alimentation UL Listed et certifié CSA

Pour le branchement électrique en Amérique du Nord, utiliser un cordon d'alimentation UL Listed et CSA Certified, à 3 conducteurs [calibre 16 AWG], avec une prise moulée 125 V [13 A], faisant au moins 1,5 m de long [six pieds] et au plus 4,5 m.

Pour le branchement électrique en Europe, utiliser un cordon d'alimentation au format international harmonisé (marqué <HAR>), à 3 conducteurs d'au moins 1 mm2 de section, 300 V, avec une gaine isolante en PVC. Le cordon doit avoir une prise moulée 250 V 10 A.

17. Courant de fuite élevé

Avertissement : courant de fuite élevé, une connexion à la terre est indispensable avant de brancher l'alimentation.

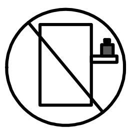
18. Interconnexion des unités



Les câbles de connexion aux interfaces RS232 et Ethernet de l'appareil doivent être certifié UL de type DP-1 ou DP-2. (Note : en cas d'installation sur un circuit dont la puissance n'est pas limitée)

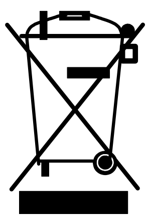
Protection contre les surintensités : le câblage de l'immeuble doit intégrer un dispositif certifié de protection contre les surintensités, calibré à 20 A et aisément accessible.

19. Ne pas utiliser comme étagère ou plan de travail



Attention : un équipement coulissant ou monté sur rail ne doit pas servir d'étagère ni de plan de travail. Les rails ne sont pas destinés à faire coulisser l'unité hors du rack. Ils sont destinés à une installation permanente à l'emplacement final, pas pour l'entretien ni la maintenance.

20. Directive DEEE



Selon la Directive 2002/96/CE (DEEE), tous les déchets d'équipements électriques et électroniques (EEE) doivent être collectés séparément et ne pas être mis au rebut avec les déchets ménagers habituels.

Ce produit et toutes ses pièces doivent être mis au rebut d'une manière responsable, respectant l'environnement.

21. Restrictions concernant l'alimentation pour la Norvège



Cet appareil est prévu pour être relié à un système d'alimentation TN et un système d'alimentation informatique de Norvège uniquement.

G.6 Installation Sicherheitshinweise(German)

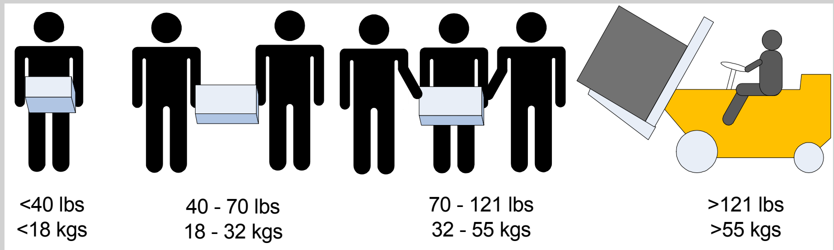
1. Installationsanleitungen



Lesen Sie alle Installationsanleitungen, bevor Sie das Gerät an die Stromversorgung anschließen.

2. Verletzungsgefahr wegen des Gewichts

Um das Produkt sicher anzuheben, genügend Personen einsetzen.



3. Schweres Gerät

Dieses Gerät ist schwer und muss mit einem mechanischen Hebegerät verschoben werden, um Verletzungen zu vermeiden.

4. Stromschlagrisiko

Stromschlagrisiko!

Bei abgenommenem Ventilatormodul sind die Stromkontakte in der Modulvertiefung zugänglich.

Es dürfen KEINE Werkzeuge oder Körperteile in die Vertiefung des Ventilatormoduls gelangen.

5. Übertemperatur

Dieses Gerät sollte nicht in einem Bereich mit einer Umgebungstemperatur über der maximal empfohlenen Temperatur von 45°C (113°F) betrieben werden. Es ist ein Luftstrom von 200 LFM bei maximaler Umgebungstemperatur erforderlich. Außerdem sollten mindestens 8 cm (3 in.) Freiraum um die Belüftungsöffnungen sein, um einen einwandfreien Luftstrom zu gewährleisten.

6. Stapeln des Chassis

Das Chassis sollte nicht auf andere Geräte gestapelt werden. Wenn das Chassis herunterfällt, kann es zu Verletzungen und Beschädigungen an Geräten führen.

7. Mehrere Stromeingänge

Risiko eines Stromschlags und Stomgefahr.

Alle Stromversorgungseinheiten sind unabhängig.

Trennen Sie alle Stomversorgungen, um einen abgeschalteten Zustand im Inneren der Switch-Plattform sicherzustellen.

8. Bei Gewitter - Elektrische Gefahr

Arbeiten Sie während eines Gewitters und Blitzschlag nicht am Gerät, schließen Sie keine Kabel an oder ab.

9. Anschließen/Trennen von InfiniBand-Kupferkabel

InfiniBand-Kupferkabel sind schwer und nicht flexible. Deshalb müssen sie vorsichtig an die Anschlüsse angebracht bzw. davon getrennt werden. Lesen Sie die speziellen Warnungen und Anleitungen des Kabelherstellers.

10. Rack-Montage und Wartung

Wenn dieses Produkt in einem Rack montiert oder gewartet wird, sind besondere Vorsichtsmaßnahmen zu ergreifen, um die Stabilität des Systems zu gewährleisten. Im Allgemeinen sollten Sie das Gestell von unten nach oben mit Geräten füllen.

11. Geräteinstallation

Diese Gerät sollte nur von geschultem und qualifiziertem Personal installiert, ausgetauscht oder gewartet werden.

12. Geräteentsorgung

Die Entsorgung dieses Geräts sollte unter Beachtung aller nationalen Gesetze Bestimmungen erfolgen.

13. Regionale und nationale elektrische Bestimmungen

Dieses Gerät sollte unter Beachtung der regionalen und nationalen elektrischen Bestimmungen installiert werden.

14. Installationscodes

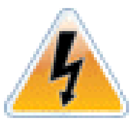
Dieses Gerät muss entsprechend der aktuellsten Version des National Electrical Code installiert weden. In Nodamerika muss das Gerät gemäß den geltenden Anforderungen des US National Electrical Code und des Canadian Electrical Code installiert werden.

15. UL- und CSA-zertifiziertes Netzkabel



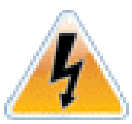
Für Nordamerika Stromanschluss, wählen Sie ein Netzkabel, das UL-und CSA Certified
3 - Leiter, [18 AWG], mit einem angespritztem Stecker bewertet bei 125 V, [15], mit einer Mindestlänge von 1,5 m [Six Feet] aber nicht mehr als 4,5 m.
Für die europäischen Zusammenhang, wählen Sie ein Netzkabel, das international harmonisiert und der Aufschrift "<HAR>",
3 - Leiter, mindestens 0,75 mm2 Draht, bewertet mit 300 V, mit einem PVC-Mantel isoliert. Das Kabel muss eine angespritztem Stecker bewertet bei 250 V, 10 A. "

16. Hoher Ableitstrom



WARNUNG: Hohe Ableitstrom; Earth Verbindung, bevor Sie die Verbindung von wesentlicher Bedeutung werden.

17. Installationscodes



Dieses Gerät muss installiert sein, entsprechend auf die neueste Version des Landes National Electrical Code. Für Nordamerika, müssen in Übereinstimmung mit den geltenden Vorschriften in der US-amerikanischen National Electrical Code und dem Canadian Electrical Code.

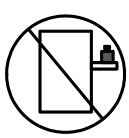
18. Verbindung der Geräte untereinander



Kabel für den Anschluss an das Gerät RS232-und Ethernet-Schnittstellen müssen UL zertifiziert Typ DP-1 oder DP-2. (Hinweis-, wenn nicht mit Wohnsitz in LPS-Schaltung)

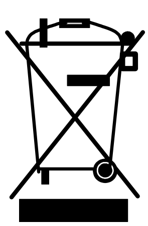
Überstromschutz: Eine leicht zugängliche Auflistung Abzweigleitung Überstrom-Schutzeinrichtung 20 A bewertet werden müssen in dem Gebäude Verkabelung.

19. Switch nicht als Regal oder Arbeitsplatz nutzen



Achtung: Auf Schieber/Schienen montiertes Gerät ist nicht als Regal oder Arbeitsbereich zu nutzen. Die Schienen sind nicht dafür bestimmt, die Einheit aus dem Gestell weg zu ziehen. Sie sind nur für die permanente Installation an einem endgültigen Standort gedacht, nicht für Instandhaltung und Wartung.

20. WEEE-Direktive



Gemäß WEEE Directive 2002/96/EC müssen alle elektrischen und elektronischen Abfallgeräte (EEE) separat gesammelt und nicht mit normalem Haushaltsmüll ensorgt werden.
Dieses Produkt und alle seine Teile in verantwortungsvoller und umweltfreundlicher Art und Weise entsorgen.

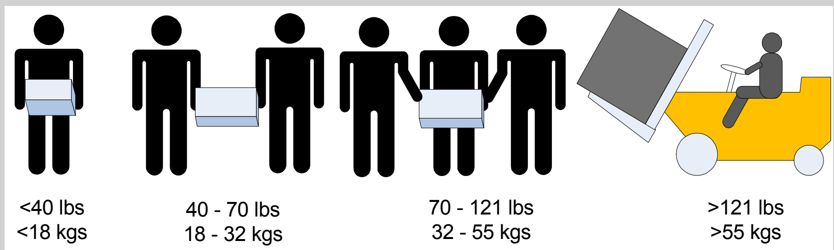
G.7 Advertencias de seguridad de instalación (Spanish)

1. Instrucciones de instalación

Antes de conectar el equipo a la fuente de alimentación, leer todas las instrucciones de instalación.

2. Lesión corporal a causa de peso

.Recurra a suficientes personas para levantar este producto sin



3. Equipos pesados

Dado que el equipo es pesado, se debe mover únicamente mediante un elevador mecánico, para evitar lesiones.

4. Riesgo de descarga eléctrica

¡Riesgo de descarga eléctrica!

Con el módulo del ventilador quitado, se obtiene acceso a las clavijas de alimentación desde dentro de la cavidad del módulo.

NO introducir herramientas ni partes del cuerpo en la cavidad del módulo del ventilador.

5. Sobretemperatura

No se debe utilizar el equipo en un área con una temperatura ambiente superior a la máxima recomendada: 45°C. Además, para garantizar una circulación de aire adecuada, se debe dejar como mínimo un espacio de 8 cm (3 pulgadas) alrededor de las aberturas de ventilación.

6. Apilamiento del chasis

Los chasis no se deben apilar sobre otros equipos. La caída del chasis podría causar lesiones corporales, así como daños al equipo.

7. Conexión redundante de fuente de alimentación: peligro de descarga

Este producto incluye una fuente de alimentación redundante o, en su lugar, una vacía. Si se dispone de una fuente de alimentación vacía, no utilizar el producto si su tapa está quitada o no está bien cerrada.

8. Tomas de alimentación múltiples

Riesgo de descarga eléctrica y peligro de corriente.

Todas las fuentes de alimentación son independientes.

Desconecte todas las fuentes de alimentación, para asegurar que no haya corriente alguna dentro de la plataforma de conmutación.

9. Al haber rayos: peligro de descarga

No utilizar el equipo ni conectar o desconectar cables durante períodos de actividad de rayos.

10. Cable de conexión y desconexión InfiniBand de cobre

Dado que los cables de cobre InfiniBand son pesados y no son flexibles, su conexión a los conectores y su desconexión se deben efectuar con mucho cuidado. Para ver advertencias o instrucciones especiales, consultar al fabricante del cable.

11. Montaje y mantenimiento del bastidor

Al instalar o realizar el mantenimiento de este aparato en un bastidor, es preciso adoptar precauciones especiales para garantizar que el sistema se mantenga estable. En general, en un bastidor, los equipos se deben instalar comenzando desde abajo hacia arriba.

12. Instalación del equipo

La instalación, el reemplazo y el mantenimiento de este equipo estarán a cargo únicamente de personal capacitado y competente.

13. Eliminación del equipo

La eliminación definitiva de este equipo se debe efectuar conforme a todas las leyes y reglamentaciones nacionales.

14. Códigos eléctricos locales y nacionales

Este equipo se debe instalar conforme a los códigos eléctricos locales y nacionales.

15. Códigos de instalación

Este dispositivo se debe instalar conforme a la versión más reciente de los códigos eléctricos nacionales del país en cuestión. En América del Norte, el equipo se debe instalar de acuerdo con las disposiciones vigentes del Código Eléctrico Nacional de los EE.UU. y del Código Eléctrico de Canadá.

16. Cable de alimentación homologado por UL y con certificación CSA

En conexiones de América del Norte, seleccionar un cable de alimentación homologado por UL y con certificación CSA de tres conductores, [16 AWG], terminado en un enchufe moldeado con capuchón de 125 voltios nominal, [13 A], con una longitud mínima de 1,5 metros, pero no más de 4,5 metros.

En conexiones europeas, seleccionar un cable de alimentación armonizado internacionalmente y marcado "<HAR>", de tres conductores, hilo de 1,0 mm2 como mínimo, 300 voltios nominal, con cobertura protectora aislante de PVC. El cable debe tener un enchufe moldeado con capuchón de 250 voltios nominal, 10 A.

17. Alta corriente de fuga

ADVERTENCIA: Alta corriente de fuga. Es esencial efectuar la conexión a tierra antes de conectar la alimentación.

18. Códigos de instalación

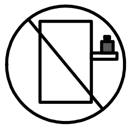
Este dispositivo se debe instalar conforme a la versión más reciente de los códigos eléctricos nacionales del país en cuestión. En América del Norte, el equipo se debe instalar de acuerdo con las disposiciones vigentes del Código Eléctrico Nacional de los EE.UU. y del Código Eléctrico de Canadá.

19. Interconexión de unidades

Los cables para la conexión con las interfaces RS232 y Ethernet de la unidad deben estar homologados por UL tipo DP-1 o DP-2. (Nota: cuando residen en circuito no de tipo LPS)

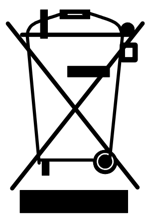
Protección contra sobrecargas: Al cableado del edificio se debe incorporar un dispositivo de protección contra sobrecargas de circuito derivado, de fácil acceso, con una corriente nominal de 20 A.

20. No utilizar el conmutador como estante ni como espacio de trabajo



Cuidado: Equipos montados en deslizadores o rieles no se deben utilizar como estantes ni como espacio de trabajo. La finalidad de los rieles no es deslizar la unidad hacia afuera del bastidor. Sirven solo para la instalación permanente en el lugar de destino final, no para fines de servicio o mantenimiento

21. Directiva WEEE



Conforme a la Directiva 2002/96/CE sobre RAEE, todos los residuos de equipos eléctricos y electrónicos (EEE) se deben recolectar por separado y no se deben eliminar junto con residuos domésticos.

Al deshacerse de este producto y de todas sus partes, hágalo de una manera responsable y respetuosa con el medio ambiente.

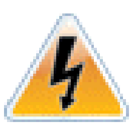
G.8 Предупреждения по технике безопасности при установке (Russian)

1. Инструкция по установке

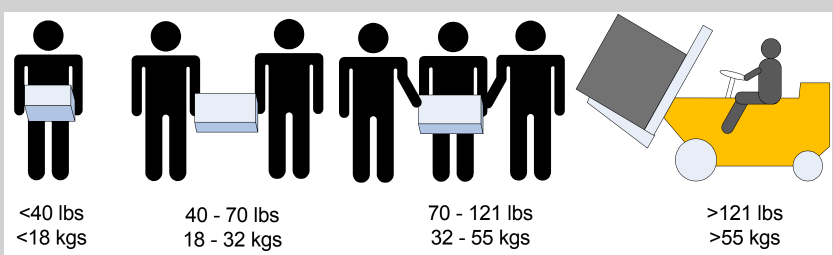


Перед подключением оборудования к источнику питания следует ознакомиться с инструкцией по установке.

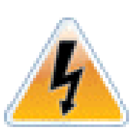
2. Травмы при переносе тяжелых предметов



Для поднятия этого изделия следует задействовать достаточное количество людей.



3. Тяжелое оборудование



Это тяжелое оборудование, поэтому его следует перемещать с помощью механического подъемника во избежание травм.

4. Опасность поражения электрическим током

Опасность поражения электрическим током!

Когда снят вентиляторный модуль, существует возможность повреждения контактов питания в его углублении.

НЕ вставлять инструменты или части тела в углубление вентиляторного модуля.

5. Перегрев

Не эксплуатировать это оборудование в помещении с температурой окружающей среды, превышающей максимально рекомендуемое значение: 45 °C (113 °F). Более того, для надлежащей вентиляции следует обеспечить зазор вокруг вентиляционных отверстий не менее 8 см (3 дюйма).

6. Установка шасси поверх другого оборудования

Не устанавливать шасси поверх другого оборудования. Падение шасси может привести к травмам и повреждению оборудования.

7. Опасность поражения электрическим током резервного источника питания

В этом изделии установлен резервный источник питания или модуль-заглушка. Если установлен модуль-заглушка, не эксплуатировать изделие со снятой или ненадежно закрепленной крышкой модуля-заглушки.

8. Несколько источников питания

Опасность поражения электрическим током и опасные энергетические воздействия.

Блоки питания независимы друг от друга.

Чтобы обесточить все компоненты внутри платформы коммутации, следует отсоединить все блоки питания.

9. Опасность поражения электрическим током во время грозы

Во время грозы запрещается использовать оборудование и подключать или отключать кабели.

10. Подсоединение и отсоединение медных кабелей InfiniBand

Медные кабели InfiniBand тяжелые и негибкие, поэтому следует осторожно их подсоединять и отсоединять. За особыми предупреждениями и указаниями следует обратиться к производителю кабеля.

11. Установка или обслуживание в стойке

При установке или обслуживании этого изделия в стойке следует обеспечить устойчивость системы. Как правило, стойка заполняется оборудованием снизу вверх.

12. Установка оборудования

Устанавливать, заменять и/или обслуживать это оборудование должен только подготовленный и квалифицированный персонал.

13. Утилизация оборудования

Это оборудование утилизируется в соответствии с национальными законами и постановлениями.

14. Местные и национальные правила установки электрооборудования

Это оборудование устанавливается в соответствии с местными и национальными правилами установки электрооборудования.

15. Правила установки электрооборудования

Это устройство устанавливается в соответствии с последним изданием национальных правил установки электрооборудования. В Северной Америке оборудование устанавливается в соответствии с действующими требованиями Национальных правил эксплуатации и обслуживания электрических установок США и Канады.

16. Шнур питания, включенный в номенклатуру UL и сертифицированный Канадской ассоциацией стандартизации (CSA)

Подключение к электропитанию в Северной Америке выполняется с помощью шнура питания, включенного в номенклатуру UL и сертифицированного Канадской ассоциацией стандартизации (CSA), 3-жильного, [16 AWG], длиной от 1,5 м [6 футов] до 4,5 м, с литой вилкой, рассчитанной на 125 В [13 А].

Подключение к электропитанию в Европе выполняется с помощью гармонизированного шнура питания с маркировкой <HAR>, 3-жильного, с сечением жилы не менее 1,0 мм^2, рассчитанного на номинальное напряжение 300 В, с ПВХ оболочкой. Шнур должен иметь литую вилку, рассчитанную на 250 В, 10 А.

17. Высокий ток утечки

Осторожно! Высокий ток утечки. Заземлить перед подключением к электропитанию.

18. Подсоединение устройств

Для подключения к разъемам RS232 и Ethernet используются кабели типа DP-1 или DP-2, сертифицированные организацией UL. (Примечание. При подключении к сети без ограниченного источника электропитания)

Максимальная токовая защита. В проводку здания в легкодоступном месте следует включить устройство защиты от перегрузки по току номиналом 20 A.

19. Не использовать коммутатор как полку или рабочую

Внимание! Оборудование, установленное на направляющих, не должно использоваться как полка или рабочая поверхность. Направляющие не предназначены для удерживания устройства, выдвинутого из стойки. Они предназначены для стационарной установки только в конечном положении и не используются для обслуживания устройства.

20. Директива WEEE

В соответствии с Директивой 2002/96/EC (WEEE) отходы электрического и электронного оборудования должны собираться и утилизироваться отдельно от обычных бытовых отходов.

Следует утилизировать это изделие и все его части ответственным и экологически безопасным способом.

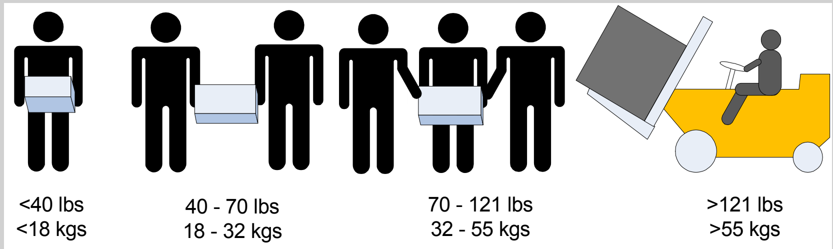
G.9 Avertismente privind siguranţa la instalare (Romanian)

1. Instrucţiuni de instalare

Citiţi toate instrucţiunile de instalare înainte de a conecta

2. Accidentare cauzată de greutate

Apelaţi la un număr suficient de persoane pentru a ridica în siguranţă acest produs.



3. Echipament greu

Acest echipament este greu şi trebuie să fie mutat folosind un dispozitiv mecanic de ridicare pentru a evita producerea de leziuni.

4. Risc de şoc electric

Risc de şoc electric!

Odată ce modulul ventilator este îndepărtat, pinii electrici sunt accesibili în cavitatea modulului.

NU introduceţi instrumente sau părţi din corp în cavitatea modulului ventilator.

5. Temperatură în exces

Acest echipament nu trebuie să fie acţionat într-o zonă unde temperatura ambiantă depăşeşte valoarea maximă recomandată: 45°C (113°F). În plus, pentru a asigura un flux de aer adecvat, lăsaţi un spaţiu liber de cel puţin 8 cm (3 inchi) în jurul fantelor de ventilare.

6. Suprapunerea cadrului

Cadrul nu trebuie să fie suprapus peste niciun alt echipament. În cazul în care cadrul cade, poate cauza leziuni corporale şi deteriorări ale echipamentului.

7. Conexiunea la o sursă de alimentare electrică suplimentară - pericol electric

Acest produs include o sursă de alimentare suplimentară sau un spaţiu gol în locul acesteia. În cazul în care spaţiul pentru sursa de alimentare este gol, nu operaţi produsul când capacul orb este îndepărtat sau nu este fixat în mod sigur.

8. Multiple mufe electrice

Risc de şoc electric şi pericol electric.
Toate aparatele cu alimentare de la reţea sunt independente.
Deconectaţi toate sursele de alimentare cu energie pentru a asigura decuplarea în interiorul platformei de comutare.

9. În timpul descărcărilor electrice - pericol electric

În timpul perioadelor cu descărcări electrice luminoase, nu lucraţi cu echipamentul sau nu conectaţi sau deconectaţi cablurile.

10. Conectarea/deconectarea cablului din cupru InfiniBand

Cablurile InfiniBand din cupru sunt grele şi inflexibile, de aceea trebuie să fie ataşate sau detaşate de conectori cu grijă. Consultaţi producătorul de cabluri pentru avertismente/instrucţiuni speciale.

11. Montarea sau depanarea într-un rack

Când acest produs este montat sau depanat într-un rack, trebuie să fie luate măsuri de precauţie speciale pentru a se asigura că sistemul rămâne stabil. În general, trebuie să umpleţi rack-ul cu echipamente începând de jos în sus.

12. Instalarea echipamentului

Acest echipament trebuie să fie instalat, înlocuit şi/sau depanat numai de către personal instruit şi calificat.

13. Eliminarea echipamentului

Eliminarea acestui echipament trebuie să se realizeze în conformitate cu toate legile şi regulamentele naţionale.

14. Codurile electrice locale şi naţionale

Acest echipament trebuie să fie instalat conform codurilor electrice locale şi naţionale.

15. Codurile ed instalare

Acest dispozitiv trebuie să fie instalat în conformitate cu ultima versiune a codurilor electrice naţionale ale ţării în cauză. Pentru America de Nord, echipamentul trebuie să fie instalat conform cerinţelor aplicabile din Codul electric naţional al SUA şi Codul electric canadian.

16. Cordon de alimentare electrică înregistrat UL şi certificat CSA

Pentru conectarea la o sursă de alimentare pentru America de Nord, selectaţi un cordon de alimentare care este înregistrat UL şi certificat CSA, cu 3 conductoare, [16 AWG], terminat cu o fişă turnată, cu putere nominală egală cu 125 V, [13 A], cu o lungime de minimum 1,5 m [şase picioare], dar nu mai lung de 4,5 m.

Pentru conectarea la o sursă de alimentare în Europa, selectaţi un cordon de alimentare care este armonizat la nivel internaţional şi marcat „<HAR>", cu 3 conductoare, cu minimum 2 fire de 1,0 mm, cu putere nominală egală cu 300 V şi cu o manta izolantă din PVC. Cordonul de alimentare trebuie să fie prevăzut cu o fişă turnată cu putere nominală egală cu 250 V, 10 A.

17. Curent de scurgere de înaltă frecvenţă

Avertisment: Curent de scurgere de înaltă frecvenţă; Împământarea este esenţială înainte de a conecta sursa de alimentare.

18. Interconectarea unităţilor

Cablurile pentru conectarea la unitatea RS232 şi la interfeţele Ethernet trebuie să fie de tipul DP-1 sau DP-2 certificate UL. (Notă- când se regăsesc într-un circuit non-LPS)

Protecţie la supracurent: Un dispozitiv de protecţie la supracurent, înregistrat în circuitul de ramificare, uşor accesibil şi cu o putere nominală egală cu 20 A trebuie să fie integrat în cablajul clădirii.

19. Nu utilizaţi comutatorul ca raft sau spaţiu de lucru

Atenţie: Echipamentul montat pe o linie de alunecare/şină nu va fi utilizat ca raft sau spaţiu de lucru. Scopul şinelor nu este de a glisa unitatea de pe rack. Acestea sunt destinate instalării permanente numai la punctul final de oprire şi nu vor fi folosite pentru depanare şi întreţinere

20. Directiva DEEE

În conformitate cu Directiva DEEE 2002/96/CE, toate deşeurile de echipamente electrice şi electronice (EEE) trebuie colectate separat şi nu trebuie eliminate împreună cu deşeurile menajere obişnuite.

Eliminaţi acest produs şi toate componentele sale în mod responsabil şi ecologic.

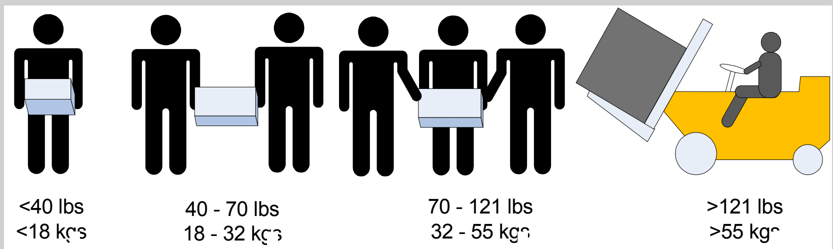
G.10 Sigurnosna upozorenja za instaliranje (Croatian)

1. Upute za instaliranje

Pažljivo pročitajte upute za instaliranje prije spajanja opreme na izvor električne energije.

2. Tjelesne ozljede uslijed težine

Kako biste sigurno podignuli ovaj proizvod, koristite dovoljan broj ljudi.



3. Teška oprema

Ova oprema je vrlo teška i treba se premještati pomoću mehaničkog dizala kako bi se izbjegle ozljede.

4. Rizik od strujnog udara!

Rizik od strujnog udara!

S uklonjenim modulom ventilatora, perima napajanja se može pristupiti u otvoru modula.

NEMOJTE umetati alat ili dijelove tijela u otvor modula ventilatora.

5. Pregrijavanje

Ovom se opremom ne bi trebalo rukovati u područjima s temperaturom okoline koja premašuje najviše preporučene vrijednosti: 45°C (113°F). Osim toga, kako bi se osigurao odgovarajući protok zraka, omogućite najmanje 8 cm (3 inča) razmaka oko otvora ventilatora.

6. Slaganje kućišta

Kućište se ne bi trebalo slagati na drugu opremu. Ako kućište padne, može izazvati tjelesne ozljede i oštećenje opreme.

7. Redundantno napajanje - Opasnost od električne energije

Ovaj proizvod uključuje redundantno napajanje ili prazan prostor na njegovu mjestu. U slučaju praznog prostora za napajanje, nemojte rukovati proizvodom ako je poklopac uklonjen ili ako nije dobro pričvršćen.

8. Višestruki ulazi za napajanje

Rizik od strujnog udara i opasnost od električne energije.

PSU jedinice su neovisne.

Odspojite sva napajanja kako biste osigurali stanje bez napajanja unutar platforme preklopnika.

9. Tijekom udara munje - Opasnost od električne energije

Tijekom djelovanja munja, nemojte raditi na opremi ili spajati ili odspajati kabele.

10. Spajanje/Odspajanje bakrenog kabela InfiniBand

Bakreni kabeli InfiniBand su teški i nesavitljivi i kao takvi se moraju pažljivo priključiti na ili isključiti iz konektora. Obratite se proizvođaču kabela za posebna upozorenja/upute.

11. Montaža ormarića i servisiranje

Kad se proizvod montira ili se servisira u ormariću, moraju se poduzeti posebne mjere opreza kako bi se osiguralo da sustav ostane stabilan. Općenito, trebali biste ispunjavati ormarić s opremom počevši od dna prema vrhu.

12. Instaliranje opreme

Ovu bi opremu trebalo instalirati, zamjenjivati i/ili servisirati samo obučeno i kvalificirano osoblje.

13. Odlaganje opreme

Odlaganje opreme trebalo bi se vršiti sukladno nacionalnim zakonima i propisima.

14. Lokalni i nacionalni električni kodovi

Ova oprema trebala bi se instalirati u skladu s lokalnim i nacionalnim električnim kodovima.

15. Instalacijski kodovi

Ovaj se uređaj mora instalirati sukladno najnovijoj verziji nacionalnih električnih kodova države. U Sjevernoj Americi oprema se mora instalirati sukladno važećim zahtjevima navedenim u US National Electrical Code i Canadian Electrical Code.

16. UL CSA kabel napajanja

Za sjevernoameričku mrežu odaberite kabel napajanja koji je na UL listi i sa CSA certifikatom, 3 - žilni, [16 AWG] (16 AWG) koji završava lijevanim utikačem nazivnog napona od 125 V, [13 A], minimalne duljine od 1,5 m [six feet] (šest stopa), ali ne dulji od 4,5 m.

Za europsku mrežu odaberite kabel napajanja koji je međunarodno usklađen i označen “<HAR>”, 3 - žilni, s najmanje 1,0 mm^2 žice, nazivnog napona od 300 V, s PVC izolacijom. Kabel mora imati lijevani utikač nazivnog napona od 250 V, nazivne struje od 10 A.

17. Veliko curenje struje

Upozorenje: Veliko curenje struje; Prije spajanja napajanja nužno je spojiti uzemljenje.

18. Interkonekcija uređaja

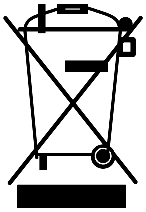
Kabeli za spajanje na jedinicu RS232 i Ethernet sučelja moraju biti s UL certifikatom vrste DP-1 ili DP-2. (Napomena - kad se nalazi u krugu bez LPS vodiča)

Zaštita od strujnog preopterećenja: Uvijek dostupni odobreni zaštitni uređaji od strujnog preopterećenja nazivne struje od 20 A moraju se ugraditi u ožičenje zgrade.

19. Nemojte koristiti preklopnik kao policu ili radnu površinu

Pozor: Oprema montirana na klizače/vodilice ne bi se trebala koristiti kao polica ili radna površina. Vodilice nisu namijenjene za povlačenje uređaja iz ormarića. Služe samo za trajnu instalaciju na konačnom položaju, a ne za servisiranje i održavanje.

20. WEEE direktiva



Sukladno WEEE direktivi 2002/96/EZ, sav električni i elektronički otpad (EEE) trebao bi se prikupljati zasebno i ne bi se trebao odlagati kao običan kućanski otpad. Odlaganje ovog proizvoda i svih njegovih dijelova vršite na odgovoran i ekološki način.

21. Električna ograničenja države Norveške



Ovaj je uređaj namijenjen samo za spajanje na električni sustav s TN uzemljenjem i na električni sustav s IT uzemljenjem države Norveške.

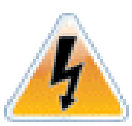
G.11 Avvertenze di sicurezza per l'installazione (italiano)

1. Istruzioni di installazione

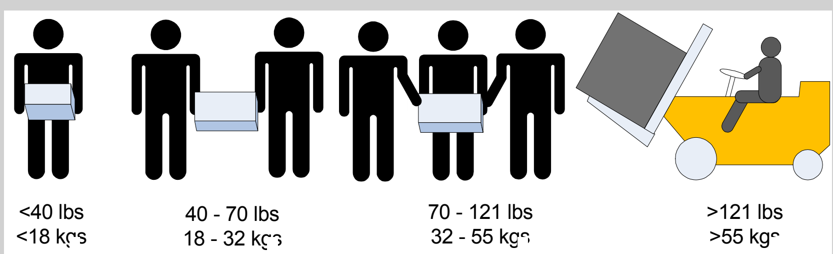


Leggere tutte le istruzioni di installazione prima di collegare l'apparecchiatura all'alimentazione.

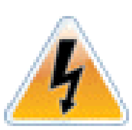
2. Lesioni a causa del peso



Usare un numero di persone sufficiente per sollevare in sicurezza questo prodotto.



3. Apparecchiatura pesante



Questa apparecchiatura è molto pesante e va spostata mediante un sollevatore meccanico, per evitare lesioni.

4. Rischio di scosse elettriche!

Rischio di scosse elettriche!
Con il modulo ventola rimosso, i pin di alimentazione sono accessibili all'interno della cavità del modulo.
NON inserire strumenti o parti del corpo nella cavità del modulo della ventola.

5. Temperatura eccessiva

Questa apparecchiatura non va utilizzata in un'area con una temperatura ambiente superiore a quella massima consigliata: 45 °C (113 °F). Inoltre, per assicurare un flusso d'aria adeguato, lasciare almeno 8 cm (3 pollici) di spazio attorno alle aperture di ventilazione.

6. Impilare lo chassis

Kućište se ne bi trebalo slagati na drugu opremu. Ako kućište padne, može izazvati tje-lesne ozljede i oštećenje opreme.

7. Collegamento di alimentazione ridondante - Pericoli elettrici

Questo prodotto è dotato di un alimentatore ridondante o, qualora esso non sia installato, di uno spazio vuoto. Qualora l'alimentatore non sia installato, non utilizzare il prodotto con il coperchio rimosso o non fissato correttamente.

8. Prese di alimentazione multiple

Rischio e pericolo di scosse elettriche.
Gli alimentatori sono tutti indipendenti.
Scollegare tutti gli alimentatori per assicurarsi che il commutatore non sia sotto tensione

9. Durante i temporali, pericolo di scosse elettriche

Durante i temporali, non effettuare interventi sull'apparecchiatura e non collegare o scollegare i cavi.

10. Collegamento/scollegamento del cavo di rame InfiniBand

I cavi di rame InfiniBand sono pesanti e non flessibili. Di conseguenza, vanno collegati o scollegati con cura dai connettori. Per avvertenze/istruzioni speciali, rivolgersi al produttore di cavi.

11. Montaggio su rack e manutenzione

Quando questo prodotto viene montato o sottoposto a manutenzione su un rack, è necessario adottare delle precauzioni speciali per assicurarsi che il sistema resti stabile. In generale, il rack va riempito con apparecchiature, procedendo dal basso verso l'alto.

12. Installazione dell'apparecchiatura

Questa apparecchiatura va installata, sostituita e/o sottoposta a manutenzione solo da personale addestrato e qualificato.

13. Smaltimento dell'apparecchiatura

Lo smaltimento di questa apparecchiatura va effettuato in conformità con tutte le leggi e le normative nazionali.

14. Codici elettrici locali e nazionali

Questa apparecchiatura va installata in conformità con le norme elettriche locali e nazionali.

15. Codici di installazione

Questo dispositivo va installato in conformità con l'ultima versione dei codici elettrici nazionali del Paese. Per il Nord America, l'apparecchiatura va installata in conformità con i requisiti applicabili del "codice elettrico nazionale USA" e del "codice elettrico canadese".

16. Cavo di alimentazione UL e munito di certificazione CSA

Per una connessione di alimentazione nordamericana, selezionare un cavo di alimentazione di tipo UL e munito di certificazione CSA, a 3 conduttori, [16 AWG], terminato con una spina stampata con tensione nominale pari a 125 V, [13 A], di lunghezza minima pari a 1,5 m [sei piedi] ma non più lunga di 4,5 m.
Per una connessione europea, selezionare un cavo di alimentazione armonizzato a livello internazionale e contrassegnato da "<HAR>", a 3 conduttori, minimo 1,0 mm2 fili, con guaina isolante in PVC. Il cavo deve disporre di una spina stampata di potenza nominale pari a 250 V, 10 A.

17. Corrente di dispersione elevata

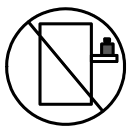
Avvertenza: corrente di dispersione elevata; il collegamento a terra è essenziale prima di collegare l'alimentazione.

18. Interconnessione delle unità



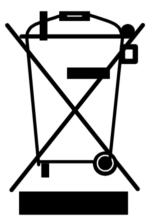
I cavi per il collegamento all’unità RS232 e alle interfacce Ethernet devono disporre della certificazione UL ed essere del tipo DP-1 o DP-2. (Nota: in caso di installazione su un circuito la cui potenza non è limitata)
Protezione contro le sovracorrenti: la cablatura dell’edificio deve integrare un dispositivo di protezione contro le sovracorrenti di potenza nominale pari a 20.

19. Non utilizzare lo switch come scaffale o piano di lavorol



Attenzione: un’apparecchiatura scorrevole o montata su binari non va utilizzata come scaffale o piano di lavoro. I binari non sono progettati per far scorrere e allontanare l’unità dal rack. Essi sono destinati all’installazione permanente solo nel luogo di lavoro e non vengono utilizzati per assistenza e manutenzione

20. Direttiva RAEE



Secondo la direttiva RAEE 2002/96/EC, tutti i rifiuti da apparecchiature elettriche ed elettroniche (RAEE) vanno raccolti separatamente e non smaltiti nei normali rifiuti domestici.
Smaltire questo prodotto e tutte le sue parti in modo responsabile e rispettoso dell’ambiente

21. Limitazioni relative all’alimentazione per la Norvegia



Questa apparecchiatura è progettata esclusivamente per il collegamento a un sistema di alimentazione TN e a un sistema di alimentazione IT.

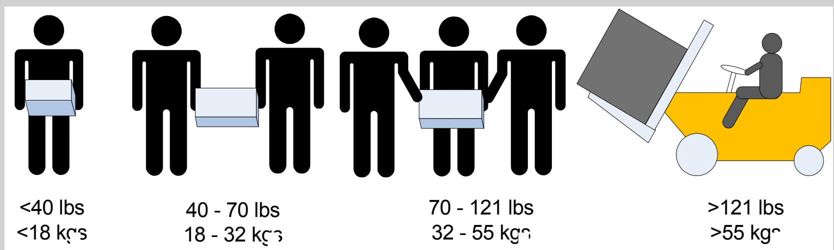
G.12 Montaj Güvenlik Uyarıları (Türkçe)

1. Montaj Talimatları

Ekipmanı güç kaynağına bağlamadan önce tüm montaj talimatlarını okuyun.

2. Ağırlık Nedeniyle Fiziksel Yaralanma

Bu ürünü güvenli bir şekilde kaldırabilmek için yeterli sayıda insandan yardım alın..



3. Ağır Ekipman

Bu ekipman çok ağırdır ve yaralanmaları önlemek için ekipmanın mekanik asansör kullanılarak taşınması gerekir.

4. Elektrik Çarpması Riski!

Bu ekipman, önerilen maksimum ortam sıcaklığını aşan alanlarda çalıştırılmamalıdır: 45 °C (113 °F). Ayrıca, düzgün hava akışı sağlamak için havalandırma deliklerinin etrafında en az 8 cm (3 inç) açıklık bırakılmalıdır.

5. Aşırı ısınma

Bu ekipman, önerilen maksimum ortam sıcaklığını aşan alanlarda çalıştırılmamalıdır: 45 °C (113 °F). Ayrıca, düzgün hava akışı sağlamak için havalandırma deliklerinin etrafında en az 8 cm (3 inç) açıklık bırakılmalıdır.

6. Şasi İstif

Şasinin diğer herhangi bir ekipmanın üzerine istiflenmemesi gerekir. Şasi düşerse, fiziksel yaralanmalara ve ekipmanda hasara neden olabilir.

7. Yedekli Güç Kaynaðý Baðlantýsý -Elektrik Çarpma Tehlikesi

Bu ürün, yedekli güç kaynağı veya onun yerine boş elektrik kutusu içerir. Güç kaynağı için boş elektrik kutusu varsa, kutunun kapağı açıkken veya tam olarak kapatılmamışken ürünü çalıştırmayın.

8. Çoklu Güç Girişleri

Elektrik çarpması riski ve enerji tehlikesi.
Bütün PSU'lar (Güç Kaynağı Üniteleri) ayrıdır.
Anahtar platformundaki gücü kapatmak için tüm güç kaynaklarının bağlantılarını kesin.

9. Şimşek - Elektrik Çarpma Tehlikesi

Gökyüzünde şimşek çaktığı zamanlarda, ekipman üzerinde çalışmayın veya kablo bağlamayın ya da kablo bağlantısı kesmeyin.

10. Bakır İnfiniband Kablo Bağlama/Bağlantıyı Kesme

Bakır İnfiniband kablolar ağırdır ve esnemezler. Bu nedenle, bağlantılara çok dikkatli bir şekilde takılmaları veya çıkarılmaları gerekir. Özel uyarılar/talimatlar için kablo üreticinize başvurun.

11. İskele Montajı ve Bakım

Bu ürün bir iskelede monte edildiyse veya bir iskele ile sunulduysa, sistemin sabit kalması için özel önlemler alınmalıdır. Genelde, ekipmanları iskeleye aşağıdan yukarı doğru doldurmanız gerekir.

12. Ekipman Montajı

Ekipmanın yalnızca eğitimli ve nitelikli personel tarafından monte edilmesi, değiştirilmesi ve/veya bakımının yapılması gerekir.

13. Ekipmanın Atılması

Bu ekipmanın imhasında tüm ulusal yasalara ve düzenlemelere uyulması gerekir.

14. Yerel ve Ulusal Elektrik Kodları

Bu ekipmanın montajında yerel ve ulusal elektrik kodlarına uyulması gerekir.

15. Montaj Kodları

Bu cihazın, ülke ulusal elektrik kodlarının son sürümüne göre monte edilmesi gerekir. Kuzey Amerika için, ekipmanın ABD Ulusal Elektrik Kodu ve Kanada Elektrik Kodu'nun uygulama koşullarına göre monte edilmesi gerekir.

16. UL Kayıtlı ve CSA Onaylı Güç Kaynağı Kablosu

Kuzey Amerika'da güç bağlantısı için, UL Kayıtlı ve CSA Onaylı bir güç kaynağı kablosu seçin, 3 - iletken, [16 AWG], 125 V değerinde, kalıplanmış bir fişle biten, [13 A], en az 1,5 m (altı fit) uzunluğunda fakat 4,5 m'den uzun olmayan bir kablo. Avrupa'da güç bağlantısı için, uluslararası uyumlu ve “<HAR>” işaretli, 3 - iletken, en az 1,0 mm2 tel, 300 V değerinde ve PVC yalıtımlı bir güç kaynağı kablosu seçin. Kablonun 250 V, 10 A değerinde bir kalıplanmış fişi olması gerekmektedir.

17. Yüksek Kaçak Akım

Uyarý: Yüksek kaçak akım varsa; güç kaynağına bağlanmadan önce mutlaka topraklama bağlantısı yapılmalıdır.

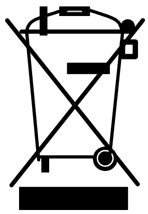
18. Ünitelerin Ara Bağlantısı

RS232 ünitesini ve Ethernet Arabirimlerini bağlayacak olan kabloların UL onaylı DP-1 veya DP-2 tipi olması gerekir. (Not- LPS olmayan devreye aitse) Aşırı Akım Koruması: Kolayca erişilebilecek 20 V Kayıtlı devre parçası aşırı akım koruma cihazının bina elektrik şebekesinde kurulu olması gerekir.

19. Anahtarı Raf veya Çalışma Alanı olarak kullanmayınl

Dikkat: Sürgülü/raylı ekipman raf veya çalışma alanı olarak kullanılamaz. Raylar üniteyi iskeleden uzağa kaydırmak için yapılmamıştır. Sadece, ekipmanın son olarak duracağı yerdeki kalıcı montaj içindir, servis veya bakım için kullanılamaz.

20. WEEE Yönergesi



WEEE Yönergesi 2002/96/EC uyarınca, tüm elektrikli ve elektronik ekipman atıkları (EEE) ayrı olarak toplanmalı ve evsel atıklarla birlikte çöpe atılmamalıdır.
Bu ürün ve tüm parçaları çevreye dost ve sorumlu bir şekilde imha edilmelidir.

21. Norveç Güç Kısıtlamaları



Bu ünite, bir TN güç sistemine ve sadece Norveç'in IT güç sistemine bağlanmak içindir.

G.13 Japan VCCI Class A Statement

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